THE IRON AGE

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Keeping Employees in Line for Promotion

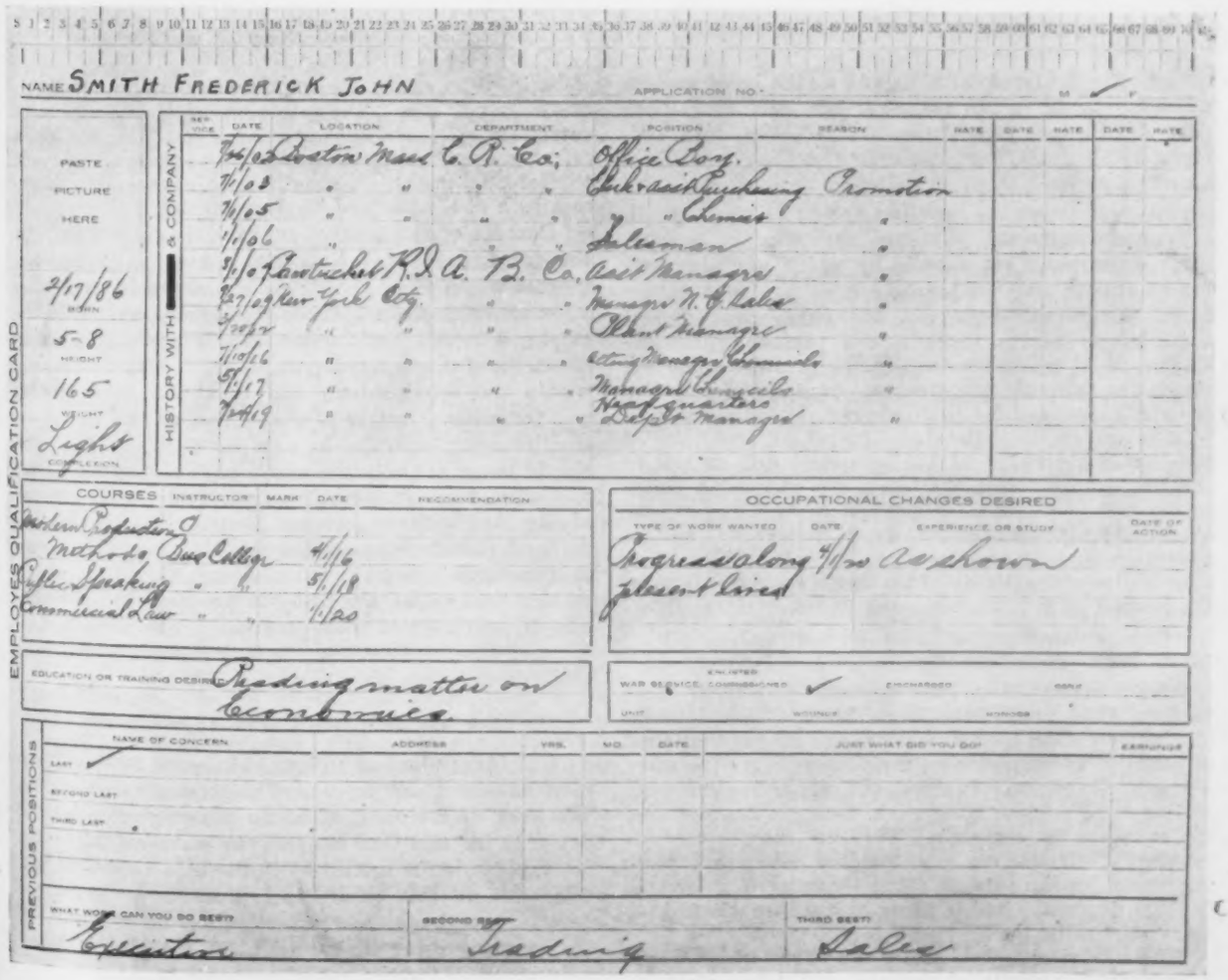
By a Perpetual Inventory of Employees, Every One Graded, Promotions Can Be Made on a Definite Basis of Knowledge

BY ROBERT I. CLEGG

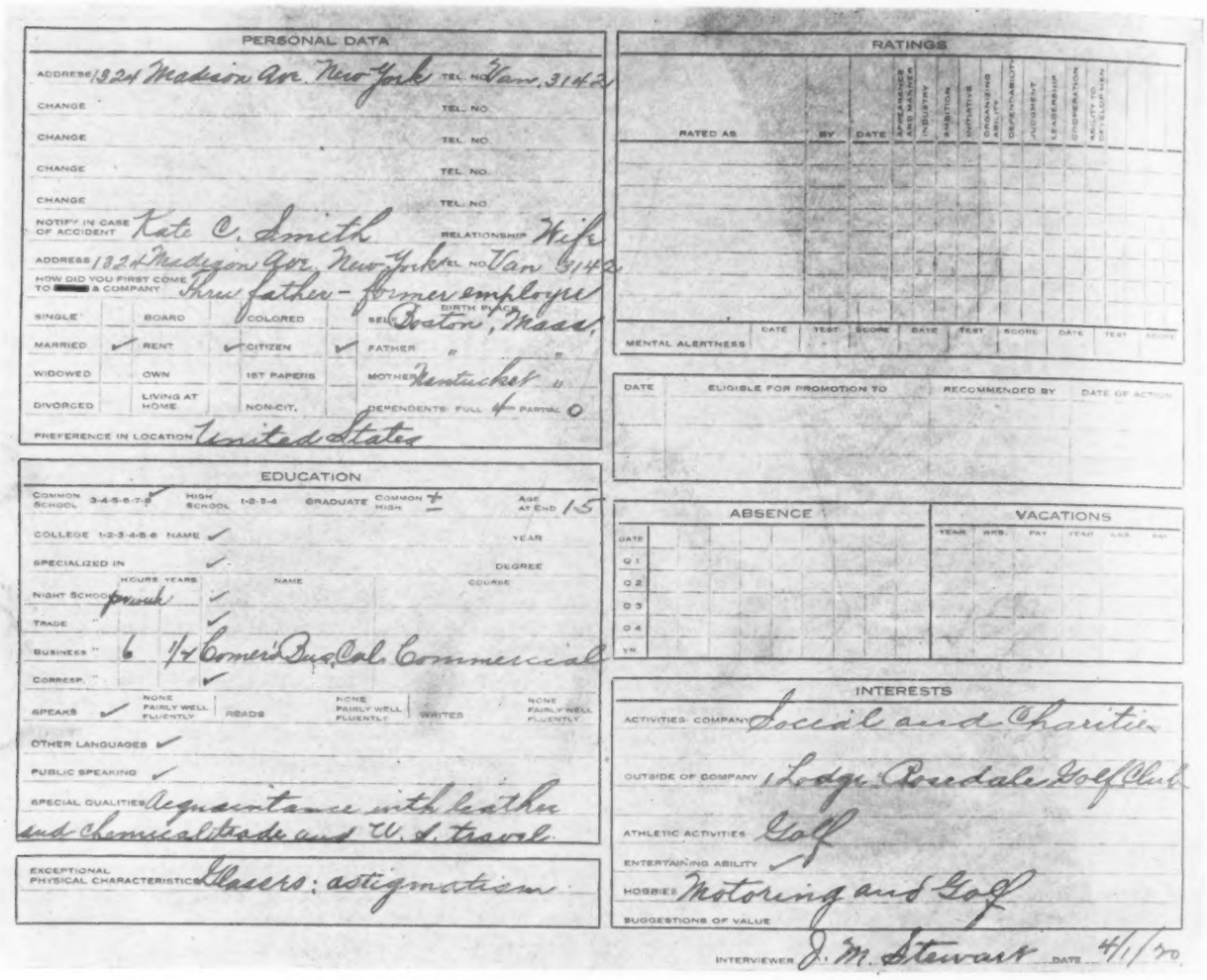
EXECUTIVES and employment managers frequently lose touch with the qualifications of men in their own organization if this be big, and almost instinctively turn to outsiders when a position is open and no one on the inside occurs immediately to their minds. As soon as it is noised abroad that such a position is available, the men on the outside send in their credentials, and their qualifications in some detail become known at once. The capacities of men on the inside, on the other hand, except such as come immediately under the supervision of those interested, are frequently lost unless some means be taken to keep in touch all the while with what the different men are doing. Many a man in one department of a large plant is eminently suited for work in another department. The other department, however, does not know him, and if he is of the type from which promotions are made, his own department head will use every effort to keep him. Such a condition results in more or less stagnation and an effort has been made in many industries to break it up.

To Avoid Burying a Good Man

Two means of meeting this situation are coming gradually into use, both being found frequently in the same plant. In the one case every position in the plant


NAME SMITH FREDERICK JOHN
APPLICATION NO.
EMPLOYEE'S QUALIFICATION CARD
PASTE PICTURE HERE
BORN 2/17/86
HEIGHT 5-8
WEIGHT 165
COMPLEXION Light
HISTORY WITH & COMPANY
SERVICE DATE LOCATION DEPARTMENT POSITION REASON RATE
Boston Mass C. R. Co. Office Boy.
Clerk and Engineering Promotion
Chemist "
Salesman "
Asst Manager "
Manager N. Y. Sales "
Asst Manager "
Acting Manager Chemicals "
Manager Chemicals "
Headquarters
Dept Sr Manager "
COURSES INSTRUCTOR MARK DATE RECOMMENDATION
Modern Production Methods Bus College 4/1/16
Public Speaking " " 5/1/18
Commercial Law " " 1/20
OCCUPATIONAL CHANGES DESIRED
TYPE OF WORK WANTED DATE EXPERIENCE OR STUDY DATE OF ACTION
Progress along present lines 4/1/20 as shown
EDUCATION OR TRAINING DESIRED Reading matter on Economics
WAR SERVICE ENLISTED COMMISSIONED ✓ ENDORSED RANK UNIT WOUNDS HONORS
PREVIOUS POSITIONS
NAME OF CONCERN ADDRESS YRS. MO. DATE JUST WHAT DID YOU DO? EARNINGS
LAST
SECOND LAST
THIRD LAST
WHAT WORK CAN YOU DO BEST? Executive
SECOND BEST? Trading
THIRD BEST? Sales

This Side of the Card Shows the Man's Record with His Company and His Successive Promotions


PERSONAL DATA
ADDRESS 1321 Madison Ave. New York TEL. NO. Van. 3142
CHANGE TEL. NO.
CHANGE TEL. NO.
CHANGE TEL. NO.
CHANGE TEL. NO.
NOTIFY IN CASE OF ACCIDENT Kate C. Smith RELATIONSHIP Wife
ADDRESS 1321 Madison Ave. New York TEL. NO. Van 3142
HOW DID YOU FIRST COME TO [redacted] & COMPANY Thru father - former employee
SINGLE BOARD COLORED BIRTH PLACE Boston, Mass.
MARRIED ✓ RENT ✓ CITIZEN ✓ FATHER "
WIDOWED OWN 1ST PAPERS MOTHER Nantucket "
DIVORCED LIVING AT HOME NON-CIT. DEPENDENTS: FULL 4 PARTIAL 0
PREFERENCE IN LOCATION United States
EDUCATION
COMMON SCHOOL 1-2-3-4-5-6-7-8 ✓ HIGH SCHOOL 1-2-3-4 GRADUATE COMMON HIGH — AGE AT END 15
COLLEGE 1-2-3-4-5-6 NAME ✓ YEAR
SPECIALIZED IN ✓ DEGREE
NIGHT SCHOOL HOURS YEARS NAME COURSE
TRADE ✓
BUSINESS " 6 1/2 Comer's Bus. Col. Commercial
CORRESP. " ✓
SPEAKS ✓ NONE FAIRLY WELL FLUENTLY READS NONE FAIRLY WELL FLUENTLY WRITES NONE FAIRLY WELL FLUENTLY
OTHER LANGUAGES ✓
PUBLIC SPEAKING ✓
SPECIAL QUALITIES Acquaintance with leather and chemical trade and W. I. travel
EXCEPTIONAL PHYSICAL CHARACTERISTICS Glasses; astigmatism
RATINGS
RATED AS BY DATE APPEARANCE AND MANNER INDUSTRY AMBITION INITIATIVE ORGANIZING ABILITY DEPENDABILITY JUDGMENT LEADERSHIP COOPERATION ABILITY TO DEVELOP MEN
MENTAL ALERTNESS DATE TEST SCORE DATE TEST SCORE DATE TEST SCORE
DATE ELIGIBLE FOR PROMOTION TO RECOMMENDED BY DATE OF ACTION
ABSENCE
DATE Q1 Q2 Q3 Q4 YR.
VACATIONS
YEAR WKS. PAY YEAR WKS. PAY
INTERESTS
ACTIVITIES: COMPANY Social and Charities
OUTSIDE OF COMPANY Lodge, Pondale Golf Club
ATHLETIC ACTIVITIES Golf
ENTERTAINING ABILITY ✓
HOBBIES Motoring and Golf
SUGGESTIONS OF VALUE
INTERVIEWER J. M. Stewart DATE 4/1/20

This Side of the Card Gives the Man's Personal Elements, His Outside Activities, Education and Hobbies

is carefully analyzed with regard to the qualifications necessary to fill it. In the other case each employee's past and present capabilities are recorded, with estimates of his fitness for promotion and along what lines he would be most likely to be useful in the future. If we have tabulated the essential details of employment, experience, judgment, physique, pay, etc., the employment department has a scale by which any applicant for promotion may be judged.

In hiring new employees, the employment department simply serves to provide a personnel; the development of this personnel to its greatest value demands the existence and constant operation of a system especially designed for this purpose. It is the function of this system to maintain a perpetual inventory of the human resources of the company, and to sell to the employee the idea that it is the company's policy to recognize individual ability and to open the avenue to individual advancement as a matter of mutual advantage to both employer and employee. The effect upon the mental attitude of the employee depends upon the method of the interview and the skill of the interviewer.

How the Information Is First Obtained

One company interviews its male employees three months after they have been hired. This interval eliminates useless clerical work in the case of that class of unstable employees who drift from job to job after a few weeks tenure. It allows the rest to become more or less familiar with their work, their environment and the spirit of the company. They are thus better able to state their desires and ambitions, and are more impressed by the idea that the company is interested in them personally and is going to some trouble to keep up contact with them.

The interview is held under conditions which insure a reasonable amount of privacy. It takes place on company time in the industrial relations department. The fact that the employee is summoned from his work helps to create the impression that the matter is one of importance. The interview itself is not a mere catechism of questions and answers, but rather a friendly conversation in which the employee is made to feel that the object sought is to advance the interests both of himself and of the company.

Benefits of this method of analysis are mutual, for the management has a special contact with its employees which gives knowledge of convenient assistance right at hand when special work comes up, while the employee knows that under such a system he is in direct line for any advancement which may be possible within the organization, and that this advancement will follow as a matter of course just as fast as opportunities occur, provided he does his part. Such a card should cover not only the man's past history with that and any other company, but notations of his special ability, his training, studies, desires, etc. With this at hand the employment manager is often able to cooperate with the man, encouraging his efforts along certain lines which are likely to prove useful, advising him in the choice of books and study, providing technical and other information, and thus making the path of promotion both easy and more certain.

How the Analysis Cards Are Handled

One large plant at Chicago has some 9000 of these cards filled out and in use. The illustration shows the two sides of the card, which in the original measures 8½ x 11 in., and thus fits into the standard letter file. No explanation is needed as to the data called for and filled out on this card. It represents the result of careful experiment and investigation on the part of the company using it, but might be modified considerably in detail for the use of concerns in other lines of work.

Upon the upper edge of the card is a numbered scale

corresponding with a guide sheet detailing definite types of positions or work. This is checked off in two or three places with crayons of different colors, and as the cards rest in an inclined position, the crayon marks are ready visible without need for cross indexing. A symbol or letter below the crayon mark enables the user of the card to determine instantly the relative value or weight of the person represented by the card.

How the Cards Are Used

The industrial relations department of the company in question uses these cards regularly when a new man is desired for any position with the company at home or abroad, and "instead of trying to guess who might be suitable we are able from the files, which are well indexed and analyzed, to send anywhere from six to twenty cards of qualified people within a few minutes to the party wishing to review them. This is a great saving of time, and also prevents men who are not anywhere near Chicago from being lost in the crowd. The value of these qualification cards is being increasingly appreciated, both by the directors and higher executives and by the people who know that their abilities are constantly on file and actually referred to at the home office."

Use of the cards is not confined to matters of individual transfers and promotions. They lend themselves to many forms of research work that provide the basis upon which a training program is developed which meets the expressed needs of employees. Many useful classifications based upon age, length of service, nationality, married status, education, mode of entrance into the company and various other factors are quickly and easily made. The drop file is especially valuable as a means of studying the relation of the above items to turnover. An occupational census can be secured on short notice. Recruits are obtained for athletic, military, musical, dramatic and social organizations. In fact, the number of uses to which the cards may be put is limited only by the ingenuity and energy of the man who has them in charge.

Keeping the Cards Up to Date

Once the system is installed, the original task of interviewing completed, and the necessary machinery for upkeep established, the entire task of keeping the cards up to date for over 5000 salaried people, interviewing new employees, supervising the use of the files, and attending to such research work as seems desirable is within the ability of one capable man to handle. All the possibilities of usefulness of the qualification cards have not yet been discovered, but large users are convinced that they are indispensable to effective personnel work.

Obviously, records of this type must be kept thoroughly up to date. Every change that is made in a man's employment should be shown on his card, and in practice it will probably be found that after the employees get used to the system they will need no urging to keep the employment manager posted at all times. The employee, when first under examination for this card, is earnestly advised to keep up with all educational and plant development matters. When his self-interest is thus aroused, he naturally continues to advise the department as new developments arise in his increasing fitness and progress.

TRAINING SALESMEN

Executive Apprentices Included in American Rolling Mill Plan of Education

The American Rolling Mill Co., Middletown, Ohio, has adopted an educational plan of unusual proportions for a manufacturing concern for the purpose of developing and training prospective salesmen and prospective minor executives. In January and July applications may be made by employees for this training, which has been designated as the "general apprentice course," and which is limited to six men in each class. Applicants must be men of good physique and address, and preferably with college or technical education, although satisfactory business or industrial experience may be accepted in lieu of school training.

Selection of Students

The applicants are interviewed by the director of employment, the general sales manager, the assistant general manager, the general superintendent, and the director of training. They are rated by each of them by the rating scale of the Bureau of Salesmanship Research. A physical examination by the company physician and an intelligence rating taken by four tests of the Bureau of Salesmanship Research are also required. The applicant's rating is the average of the above—the six highest being chosen provided their total average rating is not below six.

Interviews are again held for the six successful applicants at the end of each three months by the same officials as at first, for the purpose of noting their development and progress. When the apprentice has successfully completed the first six months of the course, the five interviewers decide by majority vote for which particular field he is best adapted. The apprentice may decide, with the advice of the director of training and the general sales manager, whether he will complete the course in accordance with the decision of the interviewers.

The Training Course

The course itself consists of two parts: (1) A schedule of practical experience in the various departments of the operating division and the general offices, and (2) a definite course of study.

The practical experience schedule is arranged as follows: Open hearth department, 2 mo.; sheet mill and annealing departments, 4 mo.; finishing, galvanizing and shipping departments, 6 mo.; inspection department, 2 mo.; betterment department, 1 mo.; employment department, 1 mo.; labor department, 1 mo.; purchasing department, ½ mo.; order department and claims and collections, 4 mo.; sales department (for sales apprentices only), 4 mo.; forge and foundry departments (for minor executive apprentices only), 4 mo. This schedule is only tentative and may be changed to suit the qualifications of individual apprentices. However, before an apprentice is allowed to leave any department he must successfully pass an examination prepared and graded by the superintendent of the department.

An Outline of the Study

The course of study includes instruction in metallurgy of iron and steel, heat treatment of iron and steel, history and chemistry of the company's products, inspection trips, including customers' plants, co-ordination discussions, business economics and industrial history, business law, salesmanship and the psychology of business (for sales apprentices only), and problems in plant management (for minor executive apprentices only).

The method of operating the course has been copied after that of the co-operative engineering courses of the University of Cincinnati; the class is divided into two sections of three men each, one section working in the plant, the other taking instruction at the training department so that each pair make one man on the job. The sections alternate each two weeks.

Married Men Paid More Than Single Men

The apprentices are given a salary which will meet ordinary living expenses, married men being given a higher salary than single men.

This course has now passed the experimental stages and has been in operation sufficiently long that the company feels that it is the best way of training these men, even though they are nonproducers half of the time.

Tests of Centrifugally Cast Steel

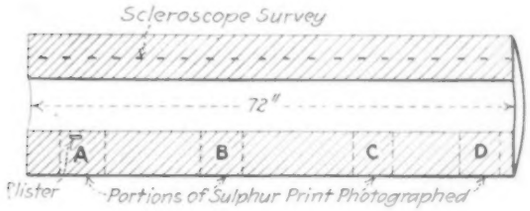
Unusual Properties of Carbon and Nickel Steel Cylinders Made by Millspaugh Process —Such Castings May Rival Forgings

BY GEORGE K. BURGESS*

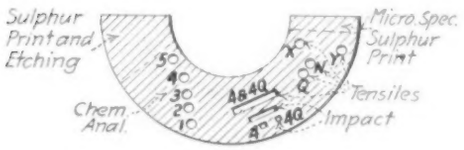
IN 1918, the Bureau of Standards had occasion to examine several hollow, steel cylinders made under the direction of W. H. Millspaugh by his centrifugal casting process. The manufacture of these centrifugal castings was carried out under somewhat adverse conditions in two steel foundries which of course, due to the limited experimental nature of the trials, could not have developed the refined technique that practice would give, nor were efforts made to produce high grade steel for these tests.

The cylinders were cast in a machine revolving about its horizontal axis. The outer surface of the castings, of walls from 3½ in. to ½ in. thick, were thus against the mold and turning faster than the free inner, cylindrical surface which was last to freeze. The outer surfaces were fairly smooth but the interior surfaces were rough.

The results, comparing the several grades of steel



Longitudinal and Transverse Section of Centrifugal Casting No. 1, Showing Location of Test Pieces



in the condition as cast and after heat treatment, are of considerable interest as indicating what may be expected from this method in the production, for certain shapes, of sound steel, *i.e.*, free from physical defects and chemical segregation, and thus with practically no waste material to discard.

As will be shown, it is also a field particularly adapted to the elimination of forging and boring operations and the substitution for the former of heat treatment to produce the desired characteristics in the resulting product.

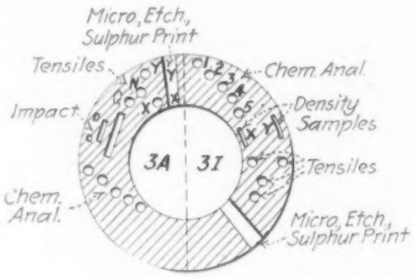
Dimensions and Tests of Castings

In all six castings were examined, samples from which were subjected to the usual mechanical tests both transverse and longitudinal, in the condition as cast and after various heat treatments. The characteristics of the metal with respect to internal stress, density, soundness, segregation and micro-structure were also studied.

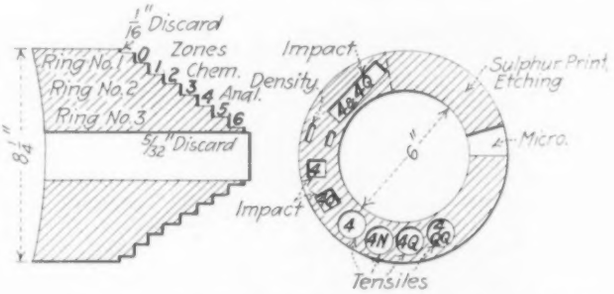
The illustrations show the dimensions of the castings and location of samples for test, except for No. 7, a cylindrical ring of diameter 12 in. and wall thickness ½ in., from which longitudinal flat tensile bars 12 in. long by 1 in. x 9/32 in. were taken. The tensile bars from all other castings were standard 2 in. round bars. Samples for chemical analysis were taken in ring turnings for Nos. 4, 5 and 7, and for Nos. 1, 3 and 6 from longitudinal borings in zones numbered 1 to 5 from outside to inside of the casting as shown.

Hardness and Chemical Surveys

Results of the radial surveys for hardness and chemical analysis show that there is a gradual increase in carbon from the outside to the inside surface for all castings, this increase ranging from 0.02 for No. 3A to 0.09 per cent for No. 5; it appears to be roughly proportional to the carbon content, or the percentage variation in carbon remains practically constant. The nickel and phosphorus appear to follow the carbon very closely in their behavior as to segregation; manganese and silicon on the other hand are nearly constant across the radial section; while sulphur, although somewhat erratic, in general is distributed similarly to carbon, as is also copper, although present in quantities less than 0.10 per cent. The hardness surveys, Brinell and scleroscope, follow closely the chemical segregation, the higher numbers occurring on the inside layers. A hardness survey with the scleroscope made midway along a longitudinal section the length (72 in.) of casting No. 1 at 3 in. intervals, shows a gradual increase in hardness from end B to the middle, 24.2 to 25.3, and then nearly uniform hardness for the second half, or from center to end, A. The chemical analysis of



Transverse Section of Centrifugal Casting No. 3 and Location of Test Pieces



Sections of Centrifugal Casting No. 4 with Location of Various Tests

the A and I sections, separated by 60 in. in the C casting, apparently shows evidence of longitudinal segregation, but this is so very slight as to be uncertain.

Density

A narrow circumferential strip 2 in. long, 1 in. broad, and ¼ in. thick was cut from the outside and from the inside of a transverse ring from the nickel steel casting No. 3-I and from the low carbon casting No. 4 and used for determination of density. The results are as follows:

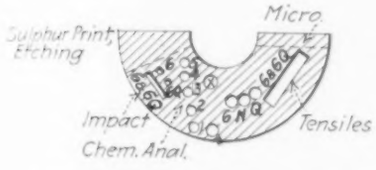
*Chief, division of metallurgy, United States Bureau of Standards. This is an abstract of the original which will appear later as a technological paper of the bureau, and which was presented by the author before the Philadelphia Chapter of American Society for Steel Treating, Feb. 16, 1921.

	Grams per Cu. Cm. at 23 Deg. C.	Difference
Casting No. 3-I, outside	7.838	
Casting No. 3-I, inside	7.834	+0.004
Casting No. 4, outside	7.834	
Casting No. 4, inside	7.726*	+0.108

*The low density of sample No. 4 (inside) is probably due to the presence of a series of very fine pits or blow holes in this sample. These holes occur about 1/16 in. from the inner surface of the casting, where their presence was actually observed.

Stresses Across Section of Tubes

Three concentric rings, ⅜ in. wide (radially) and ½ in. thick (longitudinally), were cut from the No. 4 casting (low carbon electric furnace steel, annealed)—one ring from the outside, one midway, and one from the inside of the cylinder. Accurate measurements were made of the outside and inside diameters of each ring, the distance between diametrically opposite punch marks and the distance between three sets of punch marks 2 in. apart, tangentially. A cut was then made (by a hand hack saw) midway between the 2 in. tangential marks and at an angle of 90 deg. to the diameter measured. When split thus the outer ring contracted visibly but the middle and inner rings appeared to undergo no change. Similar rings were cut from casting No. 5 (high carbon nickel steel, not annealed), measured and cut in the same manner as those from casting No. 4.



Transverse Section of Centrifugal Casting No. 6 with Location of Various Test Pieces

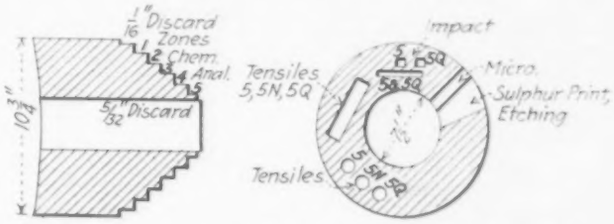
The measurements taken before and after cutting these concentric rings and the amount of expansion or contraction in each case [given in a table in the original paper] indicate the nature of the stresses in the outer, middle and inner zones. A rough computation gives the compression at outside ring of casting No. 4 as 48,000 lb. per sq. in., and for No. 5 the compression at outside ring is 31,000 lb. per sq. in. and tension at inside ring is 47,000 lb. per sq. in. These internal stresses are of the order of the elastic limits of the material and, as would be expected, the outer zone of the casting is in compression.

Heat Treatment and Mechanical Properties

Turning now to the question of the improvement of these castings by heat treatment, in Table 1, are given the details of the treatments to which material from their castings were submitted, and in Table 2 are grouped the mechanical properties associated with the respective treatments. The location of specimens is shown in illustrations. It should be recalled that castings Nos. 1, 3, 4 and 7 were annealed as a whole before any tests were made on them, while castings Nos. 5 and 6 were examined first in the condition as cast. The test pieces from 3A and 3I were from pieces of the same casting 60 in. apart.

An examination of Table 2 shows that most samples show good tensile strength for their composition and treatment, and also that there is no marked difference in values for longitudinal and transverse specimens. The values for the Izod shock test are somewhat erratic. The advantages of heat treatment, notably of the double quench and draw in improving both the resistance to shock and especially the ductility as measured by reduction of area, are strikingly manifest.

Certain of these treated steel castings would appear to compare very favorably in their properties with those of forged material of the same compositions. For example, the ordnance requirements for gun forgings are: Elastic limit, 65,000 lb. per sq. in.; tensile strength, 95,000 lb. per sq. in.; elongation, longitudinal 22 per cent, transverse 18 per cent, reduction of area, longitudinal 35 per cent, transverse 30 per cent. These are probably more than met by casting No. 6QQ (C = 0.33, Ni = 2.75 per cent), and almost met by others such as 3AQ, 3IQ (C = 0.32, Ni = 2.70 per cent). Again the properties of the casting (C = 0.23 per cent) are high for steel castings of that composition, and in the treated condition are



Sections of Centrifugal Casting No. 5 with Location of Various Tests

superior to many of the results on hot rolled 0.20 to 0.25 carbon steels and indeed are comparable to those of cold rolled steels of this grade.

Macrostructure and Microstructure

It is of interest to note there appeared no flaws or visible defects, other than small blow holes near the inner surface, in the preparation of any of the test pieces for physical or chemical examination. The blow-holes noted were always about 1/16 in. from the inner or free surface of the casting. No hard spots were found in any of the castings. Just next the inner surface of all castings there is a layer not over 1/16 in. thick which appears to contain nearly all the physical and chemical discontinuities.

Sulphur prints and cupric-ammonium-chloride etchings were made on transverse sections of each casting. Specimens for microscopic examination were cut from transverse, radial (longitudinal) and tangential sections of each casting as received and from transverse sections of the heat treated bars, after normalizing, quenching and drawing, and double quenching and drawing. [The original paper is replete with photomicrographs and sulphur prints.]

Table 1—Heat Treatment of the Various Sections. All Specimens Cooled in Air.

Sample*	TEMPERATURES AND TIME OF HEATING					
	Heated slowly in air deg. C	Then cooled and held hr.	Temperature when quenched, deg. C. First	Temperature when quenched, deg. C. Second	Quenching medium	Drawn 30 min. deg. C
1 N	800–805	2	.....	.....	.....	.....
1 Q	800–805	2	795–800	.....	Water	600
3 N†	890–900	3	.....	.....	.....	.....
3 Q	890–910	3	845–850	.....	Oil	640–650
4 N	910–925	2	.....	.....	.....	.....
4 Q	910–925	2	915–925	.....	Water	450–460
4 QQ	910–925	2	915–925	885	Water	440–450
5 N	750–760	1½	.....	.....	.....	.....
5 Q	750–760	1½	760	.....	Oil	700–705
6 N	850–860	2	.....	.....	.....	.....
6 Q	850–860	2	825–830	.....	Water	675–680
6 QQ	850–860	2	825–830	790–795	Water	680–690
7 Q	875–880	1	875–880	.....	Water	510–515
7 QQ	880–885	1	880–885	845	Water	435

*Samples 1, 3, 4 and 7 annealed; samples 5 and 6, as cast; N signifies normalized; Q, quenched and drawn; and QQ, double quenched and drawn.
†Specimens from A and I sections of No. 3 same treatment.

The most serious of the low carbon areas were found in castings Nos. 3-A and 6. These areas are not completely eliminated by normalizing and persist even after quenching and drawing, but have been almost completely eliminated by the double quench and draw treatment. The normalizing treatment, for the most part, greatly refines the structures while quenching and drawing produces a sorbitic structure with partially diffused ferrite. Structures after the double quench and draw compare favorably with those of large heat treated steel forgings.

Summary

A miscellaneous lot of five castings were examined in the form of cylinders of wall thickness 8½ in. to ½ in., made by the Millspaugh centrifugal process. Their composition ranged from two low carbon steels, C = 0.17 and 0.23 per cent, to three nickel steels ranging in carbon from C = 0.33, 0.46 to 0.66 per cent, and in nickel from Ni = 2.69, 2.35 to 2.92 per cent. Segre-

Table 2—Mechanical Properties Resulting from the Respective Treatments

Carbon and Nickel per cent	Sample* No.	Yield Point lbs. per sq. in.		Ultimate Strength in 1000 lb. per sq. in.		Elong. in 2 Inch per cent		Red. of Area per cent		Izod Impact ft. lbs. per sq. in.		Microstructure
		L	T	L	T	L	T	L	T	L	T	
C 0.44-0.50 Ni 2.32-2.39	IX	54.3	....	91.2	.....	10.5	....	12.1	....	48.8	.....	Fairly fine with coarse ferrite boundaries, few slaggy areas (Small blow holes)
	IY	53.5	....	50.5	.....	9.5	....	8.9	....	.....	.....	
	IT	....	56.5	.....	89.5	....	5.5	....	7.5	.....	.....	
	IN	67.5	....	93.0	.....	8.5	....	12.5	....	.....	.....	Fine, uniform
	IQ	87.5	91.3	89.0	105.0	4.5	6.5	11.5	14.0	85.2	.....	Very fine, uniform
C 0.32-0.34 Ni 2.66-2.75	3AX	53.8	....	89.8	.....	7.5	....	12.1	....	252.0	187.0	Fir tree crystals and a few slaggy ferrite areas (Inclusion)
	3AY	48.5	....	81.5	.....	16.5	....	22.0	....	.....	.....	
	3AT	....	50.7	.....	78.2	....	26.0	....	42.5	.....	.....	
	3AN	59.8	....	95.7	.....	16.0	....	29.3	....	.....	.....	Fine, uniform
	3AQ	67.5	70.2	98.0	90.3	21.5	20.5	47.4	42.0	309.0	704.0	Sorbitic, ferrite ghosts
C 0.30-0.35 Ni 2.66-2.76	31X	52.5	....	88.7	.....	14.8	....	19.3	....	.....	.....	Finer than 3A (Very few slaggy areas)
	31Y	48.4	....	81.8	.....	27.0	....	41.8	....	.....	.....	Fairly uniform
	31N	60.5	....	89.1	.....	9.5	....	18.5	....	.....	.....	Fine, uniform
	31Q	64.5	....	95.5	.....	21.0	....	29.9	....	.....	.....	Fine, uniform
C 0.16-0.21 Ni, None	4	40.0	....	61.5	.....	16.5	....	10.4	....	34.5	48.4	Coarse, with thick ferrite veins
	4N	47.5	....	65.0	.....	11.5	....	18.9	....			
	4Q	60.0	....	79.2	.....	13.0	....	20.3	....	247.0	304.0	Fine, trace of veins
	4QQ	55.0	....	72.5	.....	12.5	....	24.5	....	.....	.....	Fine, with streaks
C 0.63-0.72 Ni 2.90-2.94	5	48.0	65.7	85.0	84.7	2.5	1.0	1.2	1.0	16.3	16.1	Coarse pearlite
	5N	77.5	....	129.0	.....	6.5	....	5.4	....	.....	.....	Fine slaggy pearlite areas
	5Q	96.4	92.3	115.0	113.3	16.5	7.5	21.7	10.5	142.0	183.0	
C 0.31-0.35 Ni 2.69-2.81	6X	47.5	....	82.5	.....	17.5	....	21.5	....	432.0	.....	Fairly fine; ferrite veins, slaggy areas
	6Y	48.0	....	81.5	.....	17.5	....	28.5	....	.....	.....	Ingotism
	6T	....	50.0	.....	83.0	....	16.5	....	22.0	.....	.....	
	6N	60.0	....	87.5	.....	14.5	....	22.0	....	.....	.....	Fine; trace ferrite ghosts
	6Q	83.5	85.0	100.5	104.0	16.5	12.5	26.5	24.5	452.0	456.0	Very fine, pitted with holes
	6QQ	70.0	....	92.0	.....	23.0	....	44.0	....	.....	.....	Very fine, pitted with holes
C 0.22-0.25 Ni, None	7N	38.0	....	64.0	.....	35.5	....	52.5	....	.....	.....	Fine, uniform
	7Q	69.3	....	95.4	.....	18.3	....	39.2	....	.....	.....	Very fine, sorbitic, ferrite
	7QQ	57.8	....	79.0	.....	27.3	....	47.7	....	.....	.....	Very fine, all sorbitic

*X—inner zone; T—tangential; Q—quenched and drawn; Y—outer zone; N—normalized; QQ—double quenched and drawn.

gation of the elements of carbon, phosphorus, sulphur, nickel and copper appears to exist to a slight extent, but only radially, and is most marked in a narrow zone, about 1/16 in. depth, next the inner surface. Manganese and silicon do not segregate in this type of casting. The greatest carbon segregation was 0.09 per cent in nickel steel (C = 0.66, Ni = 2.92) and the least 0.02 per cent in another nickel steel (C = 0.33, Ni = 2.69).

The hardness (Brinell and scleroscope) practically follows the segregation.

The only evidence of unsoundness was the presence of small blow-holes in the inner zone, usually within 1/16 in. of surface.

The density across a section is practically constant, or 0.004 in 7.836.

The mechanical properties show, in general, somewhat greater strength, and elastic limit and resistance to shock, but less ductility in tangential than in longitudinal direction.

The internal stresses developed in the castings by this centrifugal process of manufacture, as determined from measurements on three rings from each of two castings, show values of the order of the elastic limit with the outer zones in compression.

The effect of heat treatment in improving the physical properties of the castings is very marked. The results suggest that the properties of such castings suitably treated may rival those of forgings of the same chemical composition.

The microstructure of some, at least of these castings, is better than that of ordinary castings; certain ones show pronounced ingotisms (dendritic structure). The nickel steels contain more slag inclusions than is usual in ordnance steel, showing that this centrifugal process may not clear up a basic steel. The ingotism and coarse grained structures of these centrifugal castings can, in general, only be removed by prolonged and repeated heat treatments, i.e., normalizing followed by double quench and draw.

This account is limited to a description of the tests, and no references are given as to the details of the manufacturing operations since no first-hand information concerning them was available.

New Blast Furnace of Trumbull Steel Co. Nearing Completion

President Jonathan Warner of the Trumbull Steel Co., Warren, Ohio, states that the new 600-ton blast furnace which is being built by the Trumbull-Cliffs Iron Co. is scheduled to be completed in June. It is located across the Mahoning River from the open-hearth department of the Trumbull company. Hot metal will be conveyed directly from the furnace to the steel department, the bridge for this purpose having been erected. The stock of the Trumbull-Cliffs Iron Co. is jointly owned by the Trumbull company and the Cleveland-Cliffs Iron Co., Cleveland, and by a number of interested individuals. Each of the parent companies paid $500,000 for its half of the non-par value common stock of the Trumbull-Cliffs Iron Co., and also purchased large blocks of the preferred stock. Construction of the furnace has been financed in this way and also by direct payment for construction. This plan has likewise resulted in the establishment of a large working capital.

The Trumbull Steel Co. has an option to buy the furnace property upon expiration of a stipulated period, at terms already arranged. Arrangements have also been completed whereby the Trumbull company is to secure the output of the stack at a satisfactory price. The company expects to effect a saving of $1.50 per ton in steel-making by utilizing the hot metal.

The new stack will be about 20 per cent larger than the usual modern blast furnace. Its cost will be about $3,250,000, which is somewhat less than originally anticipated because of reduction in construction costs since work was started.

President Warner states that the Trumbull company either owns outright or has leases on iron reserves sufficient to supply two blast furnaces for 12 years of normal operation. Some of these holdings are on the Mesabi range in open-pit mines.

The plant of the Stephenson Charcoal Iron Co., Wells, Mich., was recently damaged by fire. Operations, however, have been seriously affected only in the still house on the chemical side. The blast furnace is intact and will resume production soon.

High Costs Cause Much Unemployment

Plants Close to Avoid Adding to Accumulations—Curtailment of Industrial Activity More Pronounced at Pittsburgh

PITTSBURGH, March 21.—Curtailment of industrial activity in the Pittsburgh district is more pronounced now than it has been at any time before since the business reaction set in early last Fall. Evidence is found not only in the plants which are shutting down, many of which are closing for the first time in from five to a score of years, but also in the number of men seeking jobs. It is quite a common sight to see large groups of men waiting outside the delivery room of one of the Pittsburgh daily papers which carries the largest number of want ads to secure a copy of the first edition off the press. A large independent steel company, which recently made a cut in wages, accompanied this action by a sharp cut in its office forces and last week went over its employees' lists and dropped additional members of the office forces. Evidently, this company does not expect an early revival of business or figures that the reduced force should be able to handle an increase in case one develops.

Behind the plant shutdowns, among the most recent of which is that of the Farrell, Pa., works of the Carnegie Steel Co., is the desire to avoid accumulation at today's raw material and labor costs. Secondary manufacturers, producing standard articles, are conspicuous among those who see less financial loss from a complete suspension of operations than in making up stocks against a future demand. One group of manufacturers of this sort, making among other articles parts for railroad equipment, are about ready to shut down for the reason that they believe that both materials and labor will be appreciably lower by the time that the railroads again are in a position to buy. So much of the money which the railroads will receive from the Government will be needed to meet debts that it is generally believed that little railroad buying will develop until the carriers again are able to show an operating balance on the right side of the ledger. Although these manufacturers in former periods of depression always went ahead and made up stocks in the confident belief that they would be wanted when business recovered, there is no such disposition among them today.

What makes the outlook with regard to railroad purchases rather desperate is the fact that manufacturers supplying the requirements of the roads almost without exception have all of their resources tied up in shipments already made to the railroads, against which they are unable to secure payments, and this hinders them in obtaining further credits from the banks to meet their raw materials and labor accounts.

Employee Representation in Colorado

AT a meeting of the Community Council, Forest Hills, L. I., March 18, M. J. Stickel, until recently welfare director of the Colorado Fuel & Iron Co. at Pueblo, delivered an address on the employees' representation plan in effect at the plants of the company. Mr. Stickel described the plan and its operation and said that while he did not regard it as the last word in bringing about better relations of labor and capital it was a distinct move in the right direction and the good already accomplished was by no means small. He referred particularly to the fact that superintendents and foremen who were doubtful about it when it was established are now its supporters.

Mr. Stickel said that one of the most important features of the relations of the Colorado Fuel & Iron Co. to its employees is the absolute confidence which the men have in President Welborn. Unfortunately it is true, he said, that in many plants in this country employees do not believe that the recent action of companies in discharging large numbers of employees is due to lack of orders. They think it is done for the purpose of getting rid of men and later taking them back at reduced wages. This is not true at the Colorado plant. When Mr. Welborn went before the men and told them that operations must be reduced on account of lack of orders, the men believed he was telling the exact truth.

Mr. Stickel told of the experience in a rail mill where the men had volunteered to take a reduction of 20 per cent in wages in order to make it possible for the mill to operate and had later accepted the offer of the company to take a reduction of 15 per cent and try to increase production at least 5 per cent. The result has been highly satisfactory and a surprising record of production has been made.

Referring to the attitude of employees serving on committees when called upon to consider complaints, Mr. Stickel paid a high tribute to them. He said that very often in a joint committee of employees and employers, employees and representatives of the company were found voting together. Frequently the representatives of the men were more severe on their associates than were the representatives of the company.

When asked whether he thought that the fact that the employees of the Colorado Fuel & Iron Co. went on a strike in 1919 at the time of the general strike in steel plants was an indictment of the representative plan, he replied that he certainly did not think it was. The men, he said, did not want to strike and did so only after great pressure was brought to bear upon them by the cry, "Stand by the boys in the East and knock out the twelve-hour day." As the eight-hour shift was in vogue in Pueblo, the men really had no grievance, but they finally decided to go out in sympathy with the Eastern employees. However, long before the men returned in the East a large number of the employees of the Colorado Fuel & Iron Co. were back at work.

Mr. Stickel believes that the American labor movement has as its aim getting control of industry, as contrasted with the former complete control of industry by capital. His hope is that neither capital nor labor will be in absolute control, but that some system of management will be devised which will be to the benefit of all.

Indianapolis Metal Trades Meeting

Dr. Charles Aubrey Eaton will be the principal speaker at the fifteenth annual dinner and business meeting of the Indianapolis branch, National Metal Trades Association, Thursday evening, March 31. His subject will be "The Real Labor Problem." Fifteen hundred invitations have been sent to representatives of the trade in Indianapolis and Indiana, with the purpose of assembling one of the largest and most representative gatherings of business and professional men ever held in the city. Two motion pictures will be shown, "The Big Idea" and "The Kick Back," industrial dramas written by Rufus Steele and released through the Educational Film Corporation. Officers will be elected.

Employment Revival in Detroit

DETROIT, March 19.—Confirmation of the recent report from Washington that Detroit industries lead the country in the employment revival of the last

few weeks was contained in the weekly statement for last week just issued by the Employers' Association of Detroit. According to this report, 75,781 men were at work in the 79 industries of the association's membership during the week ending March 15, which was an increase of 8427 over the preceding week, and is the largest weekly increase since the business depression set in last fall.

Of the 79 industries, 41 are working their men part time, which means that 51,098 men are working reduced hours, the average being 39 hours a week. The association does not include the Ford industries, which are also working part time.

The Washington report of the United States Employment Service of the Department of Labor said that during February 20,417 men were re-employed in Detroit. The percentage of employment increase in Detroit from Jan. 31 to Feb. 28 was 34.7.

Nearly 4000 of the normal force of 20,000 was back at work in the Dodge Bros. plant on March 17.

Cleveland Foundries Less Active

Cleveland foundries are operating at an average capacity of 22 per cent, or not as well as a month ago, when the average operation was 23 per cent. The extent of operations is based on a report from 20 gray iron, malleable, steel and brass foundries. Cleveland foundries with only two or three exceptions outside of the brass foundries have made no reduction of wages and some of the foundrymen claim that they are losing business in competition with other foundries in the Central West that have made wage cuts and consequently can name lower prices on castings.

In the Field of Labor

About 120 foundrymen and pattern makers employed at the Fore River Works, Bethlehem Shipbuilding Co., Ltd., Quincy, Mass., recently went on strike as a result of a reduction in wages amounting to 10 per cent. The men had been earning 86c. an hour for an eight-hour day.

Boiler makers employed by Bertleson & Paterson, the Hodge Boiler Works, the Atlanitc Works, New England Iron Works, Roberts Iron Works, and Boston Engineers, Boston and its immediate vicinity, have voted to strike against a proposed reduction of 10 per cent in wages effective March 14, but are still at work awaiting instructions from union headquarters in Kansas City. Heretofore the men were paid 80c. to 98c. an hour. Some 600 are affected by the reduction in wages.

The Grafonola manufacturing plant at Salem, Ind., closed for nearly two months, has resumed operations with about one-fourth of workmen formerly employed. The maximum wage paid is $2.50 a day, as compared to $5 to $7 formerly. Applications at this wage have more than exceeded the demand.

The Beech Grove shops of the Big Four in a suburb of Indianapolis closed down March 19 for an indefinite time. Over 1200 workmen are normally employed. D. J. Mullen, superintendent of motive power, states that there are 62 idle locomotives in the shops in good condition and ready for use, representing an investment of $3,100,000.

The executive board of the United Mine Workers' of America, in session at Indianapolis last week, announced their intention to resist all attempts to reduce the wages of mine workers. The announcement was made by President Lewis, and referred more specifically to proposed wage reductions in Washington, southeastern Kentucky and Tennessee. Most of the union miners are working under wage agreements that do not expire until March 31, 1922.

The Salem, Ohio, plant of the Mullins Body Corporation has been temporarily shut down owing to refusal of employees to accept the company's proposal to lengthen the 8-hr. workday to nine hours, for the same wages. The men offered a counter proposal, in which they agreed to accept a 10 per cent wage reduction with a continuance of the 8-hr. day.

The Modern Refrigerator Co., Peru, Ind., is running its plant 19 hours a day, with full night and day shifts of 60 men each. Orders on the books warrant a continuance of this schedule for the rest of the year.

A 10 per cent reduction in the wage scale has been made by the Haskell & Barker Co., Michigan City, Ind., manufacturer of railroad cars. The company employs 2500 men.

First Sheets Rolled by Chapman-Price Steel Co.

The first sheets were rolled in the new mill of the Chapman-Price Steel Co., Indianapolis, Monday morning, March 21. Two mills are in operation. The company will roll all the sheets required for the fabricating end of its business. The installation consists of four finishing mills, two roughing mills and two cold mills, manufactured by the Birdsboro Steel Foundry & Machine Co. The motor drive was installed by the Falk Co., and a 1200-hp. General Electric motor furnishes the power. Two 156-in. squaring shears have been installed, and a bar shear is located in the bar storage building. Four combination sheet furnaces, and two double annealing furnaces, with four boxes each, supplied by the Tate, Jones Co., round out the equipment. A 30-ton Morgan crane has also been installed in the mill building, with a 10-ton Morgan crane in the bar storage. Two galvanizing pots have been installed in the galvanizing department, and a 10-ton Morgan crane to handle materials. The fabricating shop is now in operation, although all the equipment has not yet been installed. A coal handling system and a 200,000 gallon oil storage tank are in process of erection. The buildings were erected by the Blaw-Knox Co., Pittsburgh, and the installations were made under the supervision of Lief Lee, consulting engineer, Youngstown.

The plant will have a capacity of 25,000 tons of sheets annually. Niles Chapman is president of the company, and L. H. Price, treasurer and general manager of sales. J. J. Beck, for 18 years connected with the Youngstown Sheet & Tube Co., is vice-president and will have charge of plant operations.

The Quinley Magnesia Co. has been formed at Youngstown, Ohio, to manufacture magnesia and asbestos products. Its authorized capital consists of $100,000 of 8 per cent preferred stock and 2000 shares of non-par value common. J. C. Quinley, for a number of years consulting engineer of the Johns-Manville Co., the largest producer of such products as will be manufactured by the new company, is president, while Louis A. Kirtland, who has been secretary of the Youngstown Securities Co., will be secretary and treasurer. Construction of the first unit of the company's plant is being started on a 10-acre site located along the main freight line of the Erie Railroad at Cortland, 16 miles northwest of Youngstown. Production will start about July 1. The products to be manufactured include carbonate, calcine and block magnesia and eventually locomotive lagging, pipe covering and the like.

A joint resolution similar to that adopted by the Minnesota Legislature in regard to condemnation of the Pittsburgh basing point on steel products has been introduced in the Wisconsin Legislature by Senator Ray J. Nye of Superior, Wis., a city which occupies a position similar to that of Duluth, Minn., in respect to the iron ore and steel industries. The Wisconsin resolution urges the Federal Trade Commission to issue a complaint in the case now pending before it and "upon final hearing to grant to the public so discriminated against the utmost possible relief."

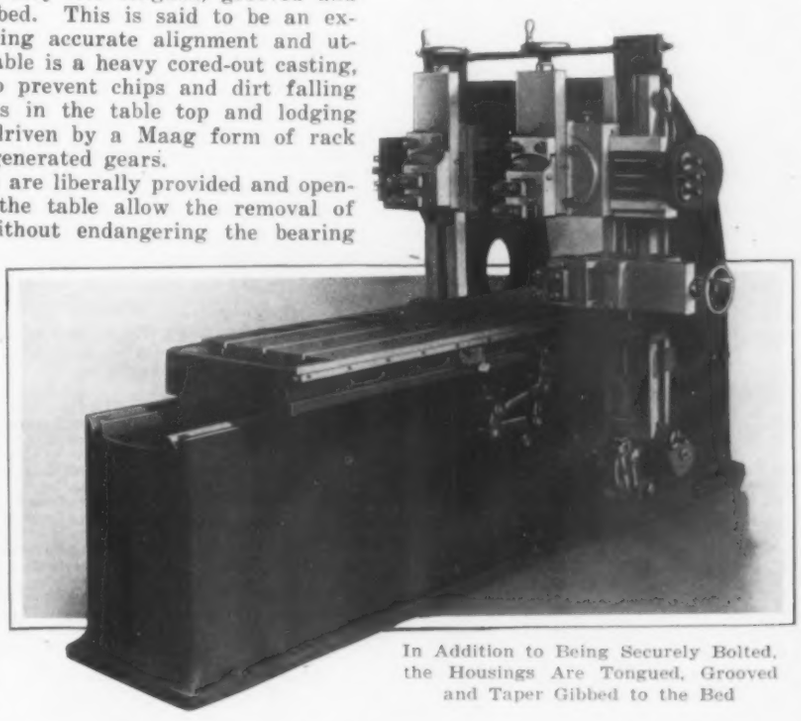
NEW PRATT & WHITNEY PLANER

Designed for High Speed Operation on Tool Work—Heavily Constructed—Added Facilities of Control

A tool room planer that is emphasized for having rugged construction of vital parts and liberal dimensions of wearing surfaces, as well as the accuracy of working surfaces and tool positions, has been recently brought out by the Pratt & Whitney Co., Hartford, Conn. It is claimed that exhaustive tests have shown that this machine is capable of taking heavy accurate cuts at extremely high speeds.

The machine is made in 6 and 8 ft. planing lengths, the maximum width of work in both cases being 26 in. and the height 20 in. The bed is of deep box section and is 9 ft. 7 in. and 12 ft. 6 in. Closed top construction with a web below the driving gears is added to the usual reinforcements. The housings are of deep arched box construction, and in addition to being securely bolted they are tongued, grooved and taper gibbed to the bed. This is said to be an exclusive feature, insuring accurate alignment and utmost rigidity. The table is a heavy cored-out casting, with closed bottom to prevent chips and dirt falling through the pin holes in the table top and lodging on the ways. It is driven by a Maag form of rack meshing with Magg generated gears.

Clamping facilities are liberally provided and openings in the side of the table allow the removal of accumulated chips without endangering the bearing surfaces. The Maag generated gearing used is said to give the table a smooth, quiet motion, resulting in accurate work at high speed. All driving gears are inclosed and run in oil. The bull gear is bronze bushed and revolves on its shaft, which is securely fixed in the bed at each end, thereby adding rigidity to this unit. Ball bearings are used on the idler pulley and the high speed shaft. This shaft runs in balance and is supported in a triple ball bearing mounting. All other bearings are of bronze and lubricated by the splash system.



In Addition to Being Securely Bolted, the Housings Are Tongued, Grooved and Taper Gibbed to the Bed

The table dogs permit of quick adjustments for length of stroke while the machine is running, without the use of a wrench. The rack and pawl action makes these stops positive without the danger of slipping. Hardened steel rollers on the rocker arm minimize the wear and provide smooth action. A handle is provided on each side of the machine to permit hand operations of the rocker arm when desired. Finer adjustment (for planing to a shoulder, etc) is provided by the micrometer screw on the front dog.

Unusual depth and ample bearing surfaces are provided for the cross rail. Clamping is accomplished by means of a single lever which operates clamps on the inner side of both housings, which is said to be an improvement over the old method of going around the machine to tighten the bolts. The clamps are powerful and the shortened distance between them is designed to reduce the length of rail liable to distortion. The rail is hung on ball thrust bearings for ease of operation. The rail heads are provided with adjustable taper gibs throughout. Increased rigidity is obtained by making the saddles in one piece and clamping the swivels by three bolts, one of which is at the top, thus distributing the holding power equally.

The heads are offset right and left so that the tools may be brought close together, and automatic feed in all directions is provided. All feed screws have graduated dials and the slide screws are mounted on ball thrust bearings. Power feeds as desired are obtained through self-contained removable ratchet-pinions, the direction of feed being governed by throwing the ratchet levers. The heads can be locked on the rail and the tool slides clamped by means of screw binders.

The countershaft is arranged for two cutting speeds. Aluminum pulleys are provided which, in conjunction with the quick acting mechanism, is said to permit short strokes without a sacrifice of speed. The combination rocker arm and hand belt shifter on the front of the machine is provided with a spring detent which assists the operator in locating the neutral position and at the same time keeps the hand lever securely in place. It is claimed that this type of lock is superior to the positive pin in that it is unbreakable and automatic. A hand belt shifter is provided on the rear of the machine permitting starting and stopping from either side.

The regular equipment includes a two-speed countershaft, complete set of wrenches, and a woven wire belt and pulley guard. Machines can be furnished with one or two heads on the cross rail and with or without a side head. An adjustable speed reversing motor can be connected directly to the high speed shaft through a coupling. The automatic control, which is of the standard Niles-Bement-Pond type, is actuated by the table dogs.

The belt drive speeds are: Countershaft 345-485 r.p.m.; cutting speeds, 30 to 42.5 ft. per min.; and return speeds, 60 to 85 ft. per min. The reversing motor drive, 5 or 7½ hp., has fourteen cutting speeds with a range of 30 to 60 ft. per min., and four return speeds with a range from 60 to 120 ft. per min.

National Metal Trades Nominees

The nominating committee of the National Metal Trades Association has prepared a list which will be passed upon at the annual meeting of the organization at Hotel Astor, New York, on April 20 and 21. The nominees are as follows:

President, A. E. Newton, Hobbs Mfg. Co., Worcester, Mass.

First vice-president, George O. Rockwood, Rockwood Mfg. Co., Indianapolis.

Second vice-president, W. W. Coleman, Bucyrus Co., South Milwaukee, Wis.

Treasurer, F. C. Caldwell, H. W. Caldwell & Son, Chicago.

Counsellors for two years: L. J. Chandler, Chandler Co., Springfield, Mass.; A. C. Gilbert, A. C. Gilbert Co., New Haven, Conn.; G. W. Mixter, Pierce-Arrow Motor Car Co., Buffalo; Paul C. De Wolfe, Brown & Sharpe Mfg. Co., Providence, R. I.; Paul T. Norton, Case Crane & Engineering Co., Columbus, Ohio.

Electric Melting in Non-Ferrous Industry

Present Status in the United States—Marked Increase in Last Year—Furnaces Sold Total 408—Sales to Foreign Melters

BY EDWIN F. CONE

THE first review of the use of the electric furnace in the non-ferrous industry was published in THE IRON AGE, March 4, 1920, and showed the number of furnaces installed or operating as of March 1, that year. In this article the data have been brought up to date as of March 1, 1921. Tables are given of the installations by companies of the various types, their product and size and in some cases other data. While the data a year ago revealed a remarkable expansion in the use of electricity as a melting medium in the non-ferrous field, at least paralleling conditions in the steel industry, the data which follow even more strikingly emphasize the tendency to have this source of heat displace the crucible and other processes. Features of the year's progress have been the new types of furnaces and the sales to foreign countries.

THE data for the year bring out the striking fact that in the United States there are 408 electric furnaces of all types installed or contracted for as of March 1, as against 261 on March 1, 1920. This is an increase of 147 furnaces or about 56 per cent. The large majority are credited to the brass industry, either foundry or rolling mill, with the rest melting other non-ferrous metals.

Four types of furnaces occupy the commanding lead with 40 or more installations. These are, in the order of furnaces contracted for: The Ajax-Wyatt, the Baily, the Detroit rocking and the Booth rotating furnace.

The pioneer among them is, of course, the Baily. For diversity of product it outranks any of the others, being used on aluminum and silver as well as brass, bronze and other alloys. A year ago there were 61 furnaces of this type; on March 1, this year, the number had expanded to 82 in the United States. Sales to foreign countries have also grown, there being four

Table of Baily Electric Furnaces Installed or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1921, as Sold by the Electric Furnace Co., Alliance, Ohio

Company and Location	Number of Furnaces	Style	Capacity of Each in K. W.	Total K. W. Rating	Product
Wm. A. Rogers, Ltd., Buffalo, N. Y.	1	Pit crucible	40	40	Silver for dinner ware
Lumen Bearing Co., Buffalo, N. Y.	3	Tilting	105	315	Yellow brass, lumen manganese bronze for bearings
Baltimore Copper Smelting Co., Baltimore, Md.	1	Tilting	105	105	Yellow brass ingot
Hays Mfg. Co., Erie, Pa.	1	Tilting	105	105	Yellow brass for plumbing goods
U. S. Aluminum Co., Massena, N. Y.	1	Rectangular	500	500	Refining aluminum
Anaconda Copper Mining Co., Butte, Mont.	1	Tilting	105	105	Yellow brass
Penberthy Injector Co., Detroit, Mich.	1	Tilting	105	105	Yellow brass for valves and injectors
Standard Sanitary Mfg. Co., Louisville, Ky.	5	Tilting	105	525	Yellow brass for plumbing goods, also manganese bronz
Michigan Smelting & Refining Co., Detroit, Mich	5	Tilting	105	525	Yellow brass ingot and rolling mill shabs
McRae Roberts Co., Detroit, Mich.	3	Tilting	105	315	Yellow brass for automobile parts
Buick Motor Co., Flint, Mich.	2	Tilting	105	210	Phosphor bronze for automobile parts
Electric Furnace Co., Salem, Ohio	5	Tilting	50 and 105	375	Test runs on brass, bronze, zinc and aluminum
Capitol Brass Co., Detroit, Mich.	2	Tilting	105	210	Yellow brass for valves and fittings
Akron Bronze & Aluminum Co., Akron, Ohio	2	Rectangular tilting	50 and 105	155	Yellow brass, red brass, gunmetal and aluminum
Nolte Brass Co., Springfield, Ohio	3	Tilting	50 and 105	155	Yellow brass for valves and fittings
Kennedy Valve Co., Elmira, N. Y.	1	Tilting	105	105	Red brass for valves
U. S. Navy, Washington, D. C.	1	Tilting	105	105	Yellow brass
Dayton Engineering Laboratories, Dayton, Ohio	3	Tilting	50 and 105	205	Aluminum for Delco products
Drew Electric & Mfg. Co., Cleveland, Ohio	1	Tilting	105	105	Yellow brass
Deming Co., Salem, Ohio	1	Rectangular tilting	50	50	Yellow brass for valves
Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.	1	Rectangular tilting	50	50	Yellow brass
Landers, Frary & Clark, New Britain, Conn.	1	Rectangular tilting	50	50	Aluminum
Miller Pasteurizing Machine Co., Canton, Ohio	1	Rectangular tilting	50	50	Yellow brass
White & Brothers, Philadelphia, Pa.	1	Tilting	105	105	Yellow and red brass
Union Brass & Metals Mfg. Co., St. Paul, Minn.	2	Tilting	105	105	Red brass
American Hardware Corporation, New Britain, Conn.	1	Tilting	105	105	Red brass
Acheson Mfg. Co., Rankin, Pa.	1	Tilting	105	105	Yellow brass
Utica Valve & Fixture Co., Utica, N. Y.	1	Tilting	105	105	Yellow brass
West Virginia Metals Products Co., Fairmount, W. Va.	2	Motor-nose tilting	105	210	Yellow brass
U. S. Copper Products Co., Cleveland, Ohio	1	Motor-nose tilting	105	105	Yellow brass
Kayline Co., Cleveland, Ohio	1	Hand tilting	50	50	Yellow brass
Atlas Brass Works, Columbus, Ohio	1	Tilting	105	105	Yellow brass
Detroit Brass Works, Detroit, Mich.	3	Tilting	105	315	Yellow brass
McKenna Brass Works, Pittsburgh	1	Tilting	50	50	Yellow brass
A. Y. McDonald Co., Dubuque, Iowa	1		105	105	Brass, bronze, etc.
Regent Brass Works, Marysville, Ohio	1		105	105	Brass, bronze, etc.
Burlington Brass Works, Burlington, Wis.	2		105	210	Brass, bronze, etc.
Pittsburgh Valve & Fixture Co., Barberton, Ohio	1		105	105	Brass, bronze, etc.
Springfield Brass Works, Springfield, Ohio	1		75	75	Brass, bronze, etc.
Wolverine Brass Works, Grand Rapids, Mich.	1		105	105	Brass, bronze, etc.
Rundle Mfg. Co., Milwaukee, Wis.	1		75	75	Brass, bronze, etc.
Thompson Mfg. Co., Dayton, Ohio	1		75	75	Brass, bronze, etc.
Sperry Gyroscope Co., Brooklyn, N. Y.	1		75	75	Brass, bronze, etc.
Metric Metals Corporation, Erie, Pa.	1		75	75	Brass, bronze, etc.
Chapman Valve Co., Indian Orchard, Mass.	1		105	105	Brass, bronze, etc.
Allis Mfg. Co., Milwaukee, Wis.	1		75	75	Brass, bronze, etc.
J. B. Wise, Inc., Watertown, N. Y.	1		75	75	Brass, bronze, etc.
W. A. Mills, Portchester, N. Y.	1		75	75	Brass, bronze, etc.
Henry Orme & Sons, St. Paul, Minn.	1		75	75	Brass, bronze, etc.
Claus Auto Gas Cock Co., Milwaukee, Wis.	1		75	75	Brass, bronze, etc.
Flood City Mfg. Co., Johnstown, Pa.	1		75	75	Brass, bronze, etc.
Evinrude Motor Co., Milwaukee, Wis.	1		75	75	Brass, bronze, etc.
Alliance Brass & Bronze Co., Alliance, Ohio	1		75	75	Brass, bronze, etc.
Bagley & Sewall Co., Watertown, N. Y.	1		50	50	Brass, bronze, etc.
Total	82				

Mitsui & Co., Japan, have purchased one 105 k. w. furnace for melting yellow brass; its capacity is 8 tons per 24 hours.
G. Amsinck Co., Mexico City, Mexico, has purchased two 105 k. w. furnaces for melting yellow brass; their capacity is 8 tons per 24 hours.
The Dominion Steel Products Co., Bradford, Ont., Canada, is credited with one 50 k. w. 2-ton furnace for melting yellow brass.
The Union Screen Plate Co., Sherbrooke, Quebec, is credited with one 75 k. w. furnace.
The Monarch Metals Co., Hamilton, Ontario, is credited with one 105 k. w. furnace.
The Empire Brass Co., London, Ontario, is credited with one 105 k. w. furnace.
Allen Everett, Ltd., Smethwick, England, is credited with one 105 k. w. furnace.
The Norsk Aluminum Co., Norway, is credited with one 105 k. w. furnace.
The Illen Smeltwerk, Norway, is credited with one 105 k. w. furnace.

credited to Canada, two each to Norway and Mexico and one each to England and Japan, or a total of 10 as compared with 4 a year ago.

The Ajax-Wyatt furnace is operating almost entirely on yellow brass and particularly on billets for rolled products. One company alone has 80 of these furnaces at its three different plants while two others have 31 and 24 respectively. Sales of these furnaces have expanded decidedly, there now being 178 as compared with 118 on March 1, 1920. This furnace has also entered the foreign field with several contracted for in France, one of which is already operating there.

The Detroit rocking furnace, originally the Gillett furnace, has been liberally sold. The number credited to this type on March 1 of this year was 57 against 44 a year ago. Of particular interest is the number of foreign sales in the last year. Companies in Japan have bought 3 furnaces while one firm in France, England and Spain have each purchased one. A year ago no foreign sales were reported.

The Booth rotating furnace is credited with 40 furnaces installed or contracted for as of March 1 against 20 a year ago, but the names of the companies using this furnace are not divulged.

The familiar Rennerfelt furnace, which is used in several industries besides the steel and non-ferrous, is credited with 13 furnaces against 9 a year ago, while the Snyder, also a well-known type, has 4.

Table of Detroit Rocking Electric Furnaces Installed or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1921, as Sold by the Detroit Electric Furnace Co., Detroit, Mich.

Company and Location	No. of Furnaces	Total Capacity KW	Lbs. Per Day	Product
Aluminum Manufacturers, Inc., Detroit, Mich.	2	600	60,000	Bronze Bearings
American Bushings Corporation, Marysville, Mich.	2	600	72,000	Bushings and bearings, bronze
American Manganese Bronze Co., Philadelphia	2	600	76,000	Bronze alloys and castings
Bethlehem Shipbuilding Corporation, Redington, Pa.	1	300	36,000	Brass and bronze marine castings
C. B. Bohn Foundry Co., Detroit,	5	1500	160,000	Brass castings and bearings and aluminum crank cases
Bound Brook Oilless Bearing Co., Bound Brook, N. J.	2	300	38,000	Bronze bearings
Bridgeport Brass Co., Bridgeport, Conn.	1	300	32,000	Phono-electric bronze for wire
Chase Metal Works, Waterbury, Conn.	4	1200	168,000	Yellow brass extrusion billets
Cleveland Brass & Copper Mills, Cleveland	1	300	44,000	Yellow brass extrusion billets
Detroit Copper & Brass Rolling Mills, Detroit, Mich.	8	2400	360,000	Yellow brass extrusion billets and flat metal bars
*Denny-Rine Co., Chicago, Ill.	1	300	44,000	Composition ingot, red and yellow mixes
Ford Motor Co., Detroit, Mich.	1	300	36,000	Brass and bronze motor bearings
General Aluminum & Brass Mfg. Co., Detroit, Mich.	2	600	72,000	Bronze bearings
General American Tank Car Corp., East Chicago, Ind.	2	300	20,000	Car journal bearings
Hills-McCanna Co., Chicago,	1	75	10,000	High pressure bronze castings
Lumen Bearing Co., Buffalo, N. Y.	1	150	15,000	Pure copper castings
Michigan Lubricator Co., Detroit, Mich.	2	600	64,000	Red and yellow brass castings
Michigan Smelting and Refining Co., Detroit, Mich.	4	1200	152,000	Red brass composition ingots
Mueller Metals Co., Port Huron, Mich.	2	600	80,000	Yellow brass extrusion billets
Oregon Brass Works, Portland, Oregon	1	300	42,000	Manganese bronze castings
	1	150	17,000	Red brass castings
Parish-Pool Co., Cleveland, Ohio	2	600	88,000	Yellow brass bars and extrusion billets
Rome Wire Works, Rome, N. Y.	1	300	36,000	Copper wire bars
Sarachan-Rosenthal Co., Rochester, N. Y.	1	300	36,000	Yellow brass ingots
Sherwood Brass Works, Detroit, Mich.	3	900	102,000	Red and yellow brass castings
M. Smolensky Mfg. Co., Cleveland, O.	1	75	9,000	Red brass castings
Standard Underground Cable Co., Perth Amboy, N. J.	1	300	50,000	Yellow brass bars and billets
Wheeler Condenser & Engineering Co., Carteret, N. J.	1	300	42,000	Yellow brass condenser tubes
White & Brother, Inc., Philadelphia	1	300	36,000	Composition brass ingots
Total	57	15,750	1,997,000	

*Denny-Rine Co. sold out to Hills-McCanna Co. and removed Detroit furnace to Parish-Pool plant in Cleveland Hills-McCanna Co. installing a smaller Detroit furnace.

Furukawa & Co., the Kobe Steel Co., and the Witsubishi Co., in Japan each have one furnace operating on brass. The Hall Street Mutual Rolling Co., Birmingham, England, Schneider & Co., in France and the Sindicoto de Maquinaria in Spain are each credited with one furnace, the latter operating on gray iron castings.

Table of Rennerfelt Electric and Electric Reverberatory Furnaces Installed or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1921, as Sold by Hamilton & Hansell, New York

Company and Location	No. of Furnaces	Capacity, Lb.	Product
Rennerfelt			
Chicago Metal Bearing Co., Chicago	2	2200	Bearing metal
Gerline Brass Foundry, Kalamazoo, Mich.	1	500	Bronze and monel metal
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.	1	500	Aluminum alloys
United States Mint, Philadelphia	1	1000	Nickel, silver and bronze
United States Mint, Philadelphia	1	2000	Nickel, silver and bronze
United States Mint, San Francisco, Cal.	1	1000	Nickel, silver and bronze
Bush Machine Tool Co., Springfield, Mass.	1	300	Aluminum alloys
Chile Exploration Co., New York	1	1000	Anodes
Haynes Stellite Co., Kokomo, Ind.	1	200	Copper
Driver-Harris Co., Harrison, N. J.	1	300	Nichrome
Hardite Metals, Inc., Long Island City	1	1000	Nichrome
Gorham Mfg. Co., Providence, R. I.	1	300	Silver
Electric Reverberatory			
Chicago Faucet Co., Chicago	1	500	Yellow and red brass
Total	14		

The British-America Nickel Corporation, Ottawa, Can. has one 1000 lb. furnace for nickel.

Table of Electric Furnaces Installed or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1921, other than the Ajax-Wyatt, Baily, Detroit and Rennerfelt Types

Company and Location	Number of Furnaces	Capacity, Lb.	Product	Type
Chicago Bearing Metal Co., Chicago	2		Brass castings	Snyder
Bayonne Castings Co., Bayonne, N. J.	1		Castings	Snyder
H. Lifehitz Brass Foundry & Machine Shop, Indianapolis, Ind.	1		Castings	Snyder
York Hardware & Brass Works, Inc., York, Pa.	1	1000	Brass and copper alloys	Weeks
Chicago Bearing Metal Co., Chicago	1	2000	Bronze	Von Schlegell
Crane Co., Chicago	4	300	Bronze & brass	Von Schlegell
Sandusky Foundry & Machine Co., Sandusky, Ohio	3	300	Brass	Von Schlegell
Bridgeport Brass Co., Bridgeport, Conn.	1	300	Brass	Von Schlegell
Ashcroft Valve Co., Bridgeport, Conn.	1	300	Brass & monel	Von Schlegell
Manning, Maxwell & Moore, Inc., Bridgeport, Conn.	1	300	Brass	Von Schlegell
Ambes Electin Corporation, Coney Island, N. Y.	1		Tin	Ludlum
Name not given	40		Brass	Booth Rotating
Total	57			

The American Metallurgical Corporation, Philadelphia, is credited with one furnace, the Weeks. Of the other distinctly steel melting or refining types there are the Greaves-Etchells and the Ludlum, each credited with one furnace in the non-ferrous industry.

An interesting development has been the introduction of new types. The Von Schlegell repelling arc furnace, decribed in THE IRON AGE, Dec. 9, 1920, has been brought out by the Industrial Electric Furnace Co., Chicago, which also sells the Snyder furnace. There are 11 of these furnaces now credited to the non-ferrous industry.

Another new furnace is the H & H electric reverberatory furnace, sold by Hamilton & Hansell, Inc., New York, agents for the Rennerfelt. It is described on other pages of this issue and is credited with one installation.

The General Electric muffled arc furnace is another new type, sold by the General Electric Co. There are 8 of these installed or contracted for, the location not being

Table of Ajax-Wyatt Electric Furnaces, Installed or Contracted for in the Non-Ferrous Industry in the United States on March 1, 1921, as Sold by the Ajax Metal Co., Philadelphia

User	No. of Furnaces	Capacity, Tons per Heat per Furnace	K. W. Rating per Furnace	Total K. W.
Ajax Metal Co., Philadelphia, Pa.	3	¼	30	90
Ajax Metal Co., Philadelphia, Pa.	1	½	60	60
American Brass Co., Waterbury, Conn.	32	¼	60	1920
American Brass Co., Torrington, Conn.	24	¼	60	1440
American Brass Co., Kenosha, Wis.	24	¼	60	1440
American Hardware Co., New Britain, Conn	1	¼	30	30
Baltimore Tube Co., Baltimore, Md.	6	¼	60	360
Bridgeport Brass Co., Bridgeport, Conn.	24	¼	60	1440
Bridgeport Brass Co., Bridgeport, Conn.	2	¾	80	160
Buick Motor Car Co., Flint, Mich.	1	¼	60	60
Chase Roller Mill Co., Waterbury, Conn.	31	¼	60	1860
Erie-Buffalo Tube Co., Erie, Pa.	1	¼	60	60
General Electric Co., Schenectady, N. Y.	1	¼	60	60
National Conduit & Cable Co., Hastings, N. Y.	3	¼	60	180
U. S. Copper Products Co., Cleveland, O.	1	¼	60	60
Raritan Copper Works, Raritan, N. J.	1	¼	60	60
Rome Brass & Copper Co., Rome, N. Y.	3	½	60	180
Scovill Mfg. Co., Waterbury, Conn.	2	½	60	120
Speakman Co., Wilmington, Del.	1	½	60	60
Specialty Brass Co., Kenosha, Wis.	1	½	60	60
Stamford Roller Mills Co., Stamford, Conn.	1	¼	60	60
Standard Sanitary Mfg. Co., Louisville, Ky.	1	¾	80	80
Standard Underground Cable Co., Perth Amboy, N. J.	2	¼	60	120
U. S. Navy Yard, Washington, D. C.	1	½	60	60
U. S. Navy Yard, Washington, D. C.	1	¼	30	30
Waclare Wire Co., Bayway, N. J.	1	¼	60	60
Western Cartridge Co., West Alton, Ill.	1	¼	60	60
W. Va. Metal Products Co., Fairmont, W. Va.	6	½	60	360
Total	178			10590

given. There are also now installed or contracted for 11 furnaces in commercial use known as the Ajax-Northrup high frequency induction furnace sold by the Ajax Electrothermic Corporation, Trenton, N. J. It is an exceedingly small unit as to melting capacity. There are also about 20 of these used in laboratories and experimental work in various industries.

Individual tables of the Ajax-Wyatt, Baily, Detroit and Rennerfelt furnaces are given herewith as well as a general table of other types. There is also a table showing the number of furnaces of each type this year as compared with a year ago.

Besides the new types of furnaces referred to, the Electric Furnace Construction Co., Philadelphia, has developed a new arc furnace for non-ferrous melting, but the details are not yet available. In this connection it is of interest to note that this same company states that satisfactory reports have been received regarding the electric resistance furnace for non-ferrous metals installed by its associated company, T. H. Watson & Co., Ltd., Sheffield, England, at the plant of Bresciana & Co., Italy, and on the same type for aluminum melting at the Lancia Motor Co., Turin, Italy.

Besides the foregoing developments, there are one or two other new types planned for concerning which details are not yet available.

Summary of Types of Electric Furnaces Installed or Contracted for in the Non-Ferrous Industry in the United States

Type of Furnace	No. of Furnaces March 1, 1921	No. of Furnaces March 1, 1920
Ajax-Wyatt	178	118
Baily	82	61
Detroit rocking	57	44
Booth rotating	40	20
Rennerfelt	13	9
H & H electric reverberatory	1	...
Snyder	4	7
Von Schlegell	11	...
General Electric	8	...
Ajax-Northrup	11	...
Weeks	1	1
Ludlum	1	1
Greaves-Etchells	1	...
Total	408	261

New Electric Furnace for Non-Ferrous Industry

Simplicity in Design, Low Melting Loss and Other Advantages Claimed for H & H Reverberatory Unit

A NEW electric furnace has been introduced into the non-ferrous melting industry. It is called the H & H electric reverberatory furnace and is sold by Hamilton & Hansell, Inc., Park Row Building, New York. It is based on U. S. patent 1,313,834, Aug. 19, 1919, and covers the generation of electric heat by means of arcs drawn between vertical electrodes and a conducting horizontal bed within the furnace. The rays of the heat thus generated strike the melting chambers not only directly but also indirectly by reverberating downward from the roof, if this is given the proper curvature.

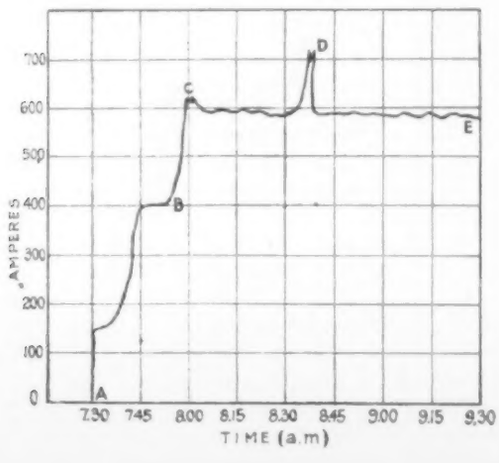
A range of temperatures is obtained by shortening or lengthening the arcs formed between the electrodes and the conducting bed, and a smothered arc is secured by bringing the electrodes in direct contact with this conductor. In the latter case the same conditions will prevail as in ordinary fuel-fired reverberatories. The smelting of ores, reduction of chemicals, distillation processes, bullion smelting and melting, refining of copper, etc., and also the melting of all of the non-ferrous metals and alloys are claimed possible.

The furnace is rectangular and built of common firebrick retained within a reinforced steel box for the smaller sizes and held together with buckstays, skewbacks, etc., for large capacities. The smaller sizes can be made tiltable, whereas the large furnaces must always be stationary. The roof is also of common firebrick and can be built stationary or removable. The electrodes enter through this roof vertically and the number of electrodes depend principally on the characteristics of the current, but to some extent also on the size of the furnace. When three-phase current is available, the number of electrodes should be three or a multiple of three. If only single-phase or direct current is available, the power is divided between two or more electrodes.

The bottom of the furnace contains the conducting bed. This bed consists of a trough running lengthwise through the center. This is filled with coarse carbon particles, which not only protect the carborundum trough, but also promote smooth burning of the arcs by introducing a considerable resistance in series with the arcs and also acts as the heating element when the smothered arc is used. Doors are provided through which this trough may be removed and renewed.

The melting chambers are located on both sides and somewhat below the top of the conducting bed. These chambers are lined with either acid or basic materials. These hearths can discharge through a common spout or may be independent of each other. In the latter case it is possible to tap either one without disturbing the process going on in the other. Charging doors are provided for each hearth so as to load up the furnace with the utmost speed.

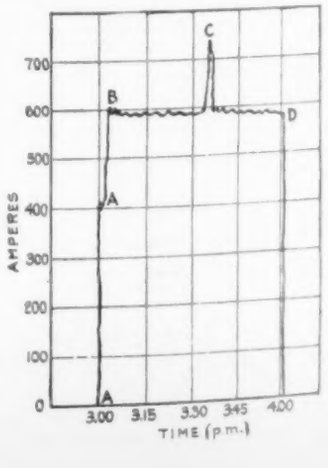
The electric equipment necessary is simple, mainly because only one voltage of 100-volt low tension is required, as all heat regulation is obtained by fixing the distance between the conducting bed and the electrodes. No external resistance is necessary. In general, therefore, the electric equipment consists of oil switch, transformer, instruments and the necessary cables or bus-

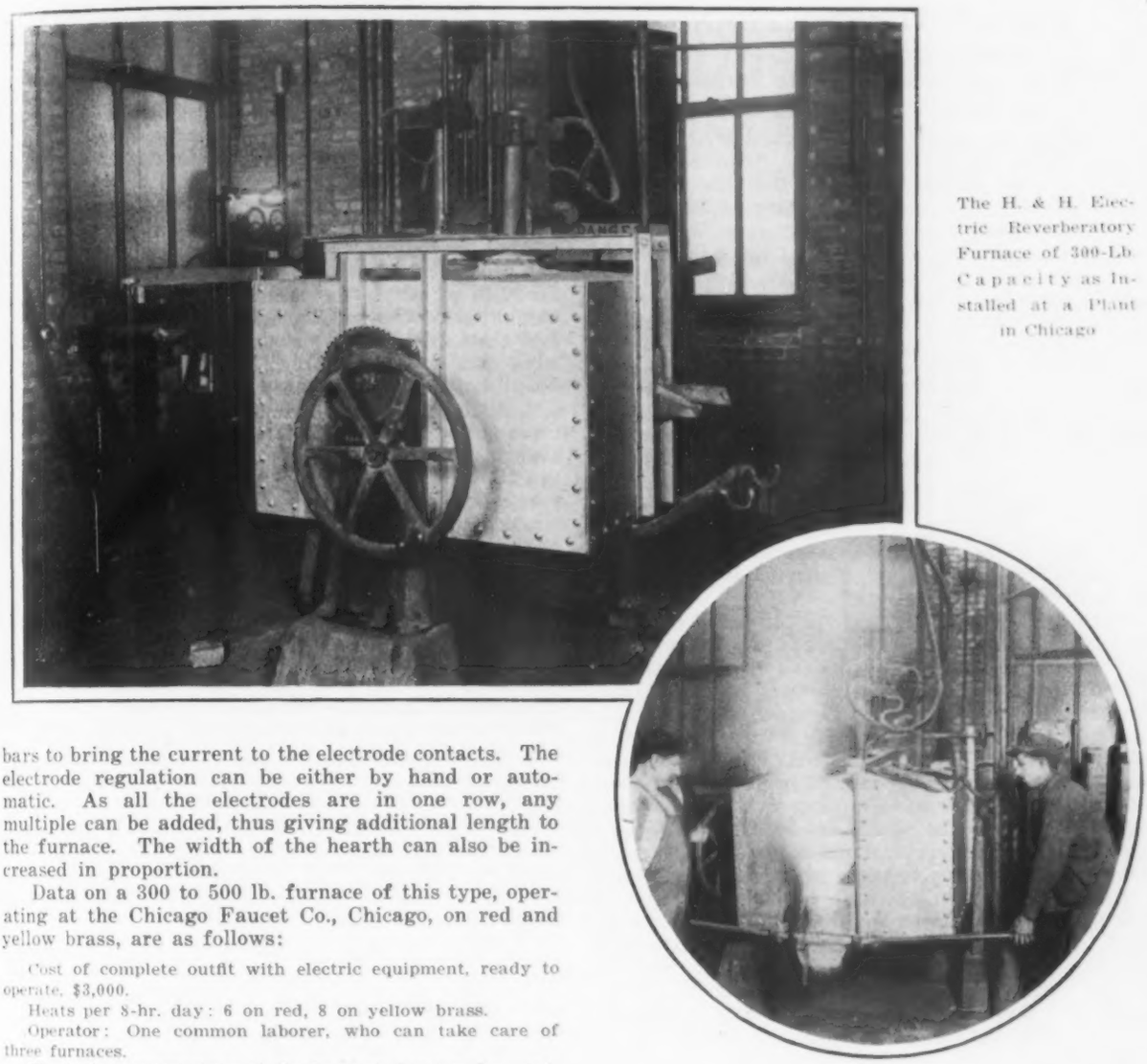


Single-Phase Operation and Ampere Curves for 50 Kva.-100 Volts Secondary Electric Reverberatory Furnace. Voltage steady at 96 volts; power factor, 92 per cent

First Heat (Left) on Cold Furnace. *A* to *B*, electrodes in contact; *B* to *E*, electrodes arcing. Regulation: Electrodes raised at *B*, *C* and *D*. Material melted at *D*; poured at *E*. Temperature of metal in crucible, 2120 deg. Fahr.

Fourth Heat (Right) on Hot Furnace. Regulation: Lowered electrodes at *A*; raised at *B* and *C*; material melted at *C*; poured at *D*. Temperature of metal in crucible, 2200 deg. Fahr.





The H. & H. Electric Reverberatory Furnace of 300-Lb. Capacity as Installed at a Plant in Chicago

bars to bring the current to the electrode contacts. The electrode regulation can be either by hand or automatic. As all the electrodes are in one row, any multiple can be added, thus giving additional length to the furnace. The width of the hearth can also be increased in proportion.

Data on a 300 to 500 lb. furnace of this type, operating at the Chicago Faucet Co., Chicago, on red and yellow brass, are as follows:

Cost of complete outfit with electric equipment, ready to operate, $3,000.

Heats per 8-hr. day: 6 on red, 8 on yellow brass.

Operator: One common laborer, who can take care of three furnaces.

Electrode consumption: ½ lb. for each 100 kw. hr. used.

Resistor consumption: ½ lb. for each 100 kw. hr. used.

Metal loss: Red brass, less than ½ per cent on ingots, scrap or borings; yellow brass, less than 1 per cent on ingots and scrap, and less than 2 per cent on borings.

Power consumption: Red brass, from 300 to 400 kw. hr. per ton, depending upon size of charge; yellow brass, from 240 to 360 kw. hr. per ton, depending upon size of charge.

Refractory cost: Furnace is lined with common firebrick, life of which is almost indefinite.

Many Uses of Wire

Among the large variety of uses for wire, outlined by J. H. Schilling, superintendent of the rod and wire ills of the Youngstown Sheet & Tube Co., Youngstown, Ohio, are the following: Electric conductors and scientific instruments; carding machines for textile purposes; the manufacture of rope for marine, mining, agricultural, engineering and other uses; fabrication of sieves, screens, gauze, cloth, netting, blinds, fenders, guards, brushes, springs, screws, culinary utensils, cages, baskets, mats, picture and clothes-lines, spectacle frames, watch springs, pins, needles, nails, rivets, fish hooks, umbrella ribs, corkscrews, drills, hooks and eyes, buckles, spangles, filigree work, etc.; musical instruments; gates, railings, fences, trellis work. This list of uses covers wire manufactured from the various metals and in sizes from about ¾ in. down to 1-7000th in.

The more delicate classes of wire, states Mr. Schilling, are used in scientific instruments, such as telescopes, levels, etc. Wire in the eye pieces of such appliances in the form of hair or spider lines for assisting in the observations of moving stars, planets or bodies and their respective angles, and for measuring angles and determining elevations, is so fine that the hairs of the head seem large in comparison. A human hair measures approximately 1-500th part of an inch in diameter, whereas platinum wire has been drawn to 1-7000th of an inch, and even 1-25000th of an inch, but the last example is more a scientific curiosity than a product of much practical utility. In drawing such a delicate wire, the platinum is coated with silver and after it is drawn as fine as possible, the silver coating is dissolved in nitric acid.

Improvement at Indianapolis

Marked improvement is noticed in the operation of automobile plants in the Indianapolis district. Some of these plants are now operating at 80 per cent of capacity, but a general average would probably be closer to 40 per cent, as compared with 10 to 25 per cent six weeks ago. Foundries and drop forging plants supplying the industry are running at about 60 per cent of capacity, and have enough orders booked ahead to keep them running at this rate for 60 days. The motor truck business is also showing a decided improvement, and manufacturers of parts are now running at about 40 per cent of capacity.

Finishing touches are now being put on No. 2 blast furnace of the Carnegie Steel Co. at Farrell, Pa., which has been rebuilt at a cost of $600,000. The stack's capacity has been increased from 350 to 500 tons daily. Relighting of the furnace will be held up pending improvement in business conditions. Meanwhile work of relining No. 1 in the same group will be undertaken.

The Rapid Transit Commission of Cincinnati has approved plans for Section 4 of the rapid transit loop, and City Engineer Krug was instructed to start advertising for bids for its construction on April 1. It is estimated that the cost of this section will be in the neighborhood of $500,000.

READJUSTMENT PLANS

War Liquidation Board May Be Formed—Many Serious Problems Receiving Attention

WASHINGTON, March 22.—The placing of the sales branch, Army supply division, War Department claim board and the foreign claims section directly under the jurisdiction of Assistant Secretary of War Wainwright, last week by order of Secretary Weeks, has been looked upon as a forerunner of the establishment of a centralized war liquidation board, in which President Harding has taken a personal interest. Development of that plan remains to be brought about and if it is put into effect along the lines that have been contemplated, it probably will be a considerable time before it is in operation. The orders of Secretary Weeks eliminate the general staff as to supervision over the organizations mentioned and mean that disposal of surplus property, advertising sales, settlement of claims, etc., will be arranged directly through the assistant secretary instead of the roundabout method through the general staff. The orders are in conformity with the policy of centralizing procurement of munitions and supplies and liquidation of surplus property under the assistant secretary.

While the powers of any liquidation board would be broad, if it is set up, nevertheless it is believed that each department of the Government disposing of surplus property or engaging in the many other activities associated with liquidation, will maintain a more or less free hand in conducting its own affairs. It is assumed that the board would consist of experienced business men and would relieve cabinet officers of many details that they now have to contend with directly or indirectly. The board would also be expected to be a coordinating agency which would acquaint each department with the surplus property of the others and make it possible for one to purchase from another when it is found the Government has the required material on hand. It is claimed that different departments have gone into the open market for requirements which are held as surplus. More expeditious settlement of war contracts would also be possible and many suits in the court of claims prevented, according to the opinion of observers.

America a Dumping Ground

This is only one of many plans of reorganization and legislation that the Administration has in mind and it is thoroughly recognized that the program is an ambitious one that will require care, time and much study to work out satisfactorily. The legislative program as to tariff and taxation is easily one of the most crowding issues. Anti-dumping legislation has been approved by the President and quick action on a tariff of a permanent character, based on American valuations, found additional support when it was learned how greatly imports of dairy and animal products, cotton, wool and grain had increased and exports decreased in February. It has been declared America has been made a veritable dumping ground for these products of which there already is a great surplus, though one Government official said it was a striking fact that retail prices had declined but little, if any, while wholesale prices had been cut substantially. This fact, as well as the usual opposition that arises against tariff legislation, may retard its progress through Congress. Basing valuations on American exchange is a decided departure for this Government and in itself would be a big factor in increasing duties, particularly at this time when the value of the American dollar is so high and the money of practically all other countries is at a low rate of exchange. Embargo legislation is believed to be altogether unlikely.

Will Move Cautiously

It is evident that the Administration is not going to rush headlong into its many problems and attempt a solution that is too precipitate. Attention is being given to such big questions as unemployment, wage reductions and the cost of living. The reduction in the cost of living has not been so marked as had been hoped, but it is considered that a much further decline is inevitable before a proper wage readjustment and restoration of industrial operations to a normal scale can be made.

It is a question as to how much of a factor transportation may prove to be in connection with readjustments, but it is evident the railroads stand ready to make good their promise to reduce rates where it is shown existing levels are stifling traffic and causing a loss of revenue. This was shown by the voluntary request last week of railroads, granted by the Interstate Commerce Commission, to reduce transcontinental rates on lumber and those on livestock from the Southwest. The change consisted both of reductions and realignment of rates on a more scientific scale and if the iron and steel industry shows present rates mean a loss, it is assumed they will be readjusted.

SHIPPERS PROTEST

Vigorous Objection to Advance in Freight Rates in New England States

The six governors of the New England States, to whom the railroads in that section of the country appealed for help in securing an advance in freight and passenger rates, appointed a committee to investigate industry's attitude toward the proposed tariff. This committee the past week held meetings at Boston. In their appeal to the governors, the railroads stated they estimated the carriers will fall $27,000,000 short of meeting fixed charges in 1921.

Edgar J. Rich, counsel for the Associated Industries of Massachusetts and formerly chief counsel for the Boston & Maine Railroad, comes out strongly in favor of a receivership for the New York, New Haven & Hartford Railroad, stating the road's credit cannot be restored by increases in rates, "for rates have already gone beyond the point of maximum productivity. The New Haven officials make a good deal of the fact that the Government valuation will be at least equal to their total capitalization. Valuation will never solve the railroad problem. Rates are not fixed on valuation; they are based on commercial conditions, and an increase in rates which might theoretically yield a given return on valuation undoubtedly would be so high as to greatly diminish traffic."

James H. Hustis, president Boston & Maine Railroad, when before the committee, while declining to admit that the proposed increase in rates is sought to save the New Haven road from receivership, said that the Boston & Maine and other New England roads could get along without the increase. He qualified this statement by saying that while the Boston & Maine could meet fixed charges at the present rates, it could not make necessary improvements.

At another period a member of the committee stated the railroads seemed to be between the devil and the deep sea, in that the Railroad Labor Board determines how much wages they shall pay, while the Interstate Commerce Commission decides what the income shall be. He then asked if shippers have tried to present the matter to the Railroad Labor Board.

William H. Chandler, representing the Boston Chamber of Commerce, replied that shippers have appealed to the Labor Board and have been notified that the board will not hear them. The shippers have not taken this as a final answer, having engaged counsel in Chicago. William F. Garcelon, representing textile interests, declared the Railroad Labor Board had not shown itself to be very sympathetic, and suggested that if that board did not give railroad relief through a reduction in wages, the governors' committee can go to Congress and should go the limit.

In addition, there was a general storm of protest at the committee meetings against a rate increase from industrial interests, bitter attacks on the mismanagement of the New England railroads, more especially the New Haven system, and frequent appeals for lower wages of railroad employees, as well as intimations that employees will not accept wage reductions.

Blast Furnace Flue Dust Recovery

Direct Process of Wet Recovery Avoids Necessity for Sintering or Briquetting—Self-contained Automatic Apparatus Used

BY GEORGE B. CRAMP*

WITH a plentiful water supply available, other considerations in connection with the installation of a wet washing system for cleaning blast furnace gas, and incidentally a flue dust recovery system, are:

1. Dry dust catchers for receiving and holding the heavier dust particles such as are carried from the blast furnace by the gas under normal working conditions, and also the bulkier coke, ore and limestone stock thrown from the furnace during a slip.

2. Wet gas washers or scrubbers for washing out of the gas all dust remaining therein after having passed through the dry dust catcher.

3. Disposal of the dirty wash water from the gas washers or other apparatus in which the water has been used in any manner to wash dust from the gas.

4. Recovery and treatment of the wet dust from the wash water, along with the flue dust recovered in a dry state from the dry dust catchers.

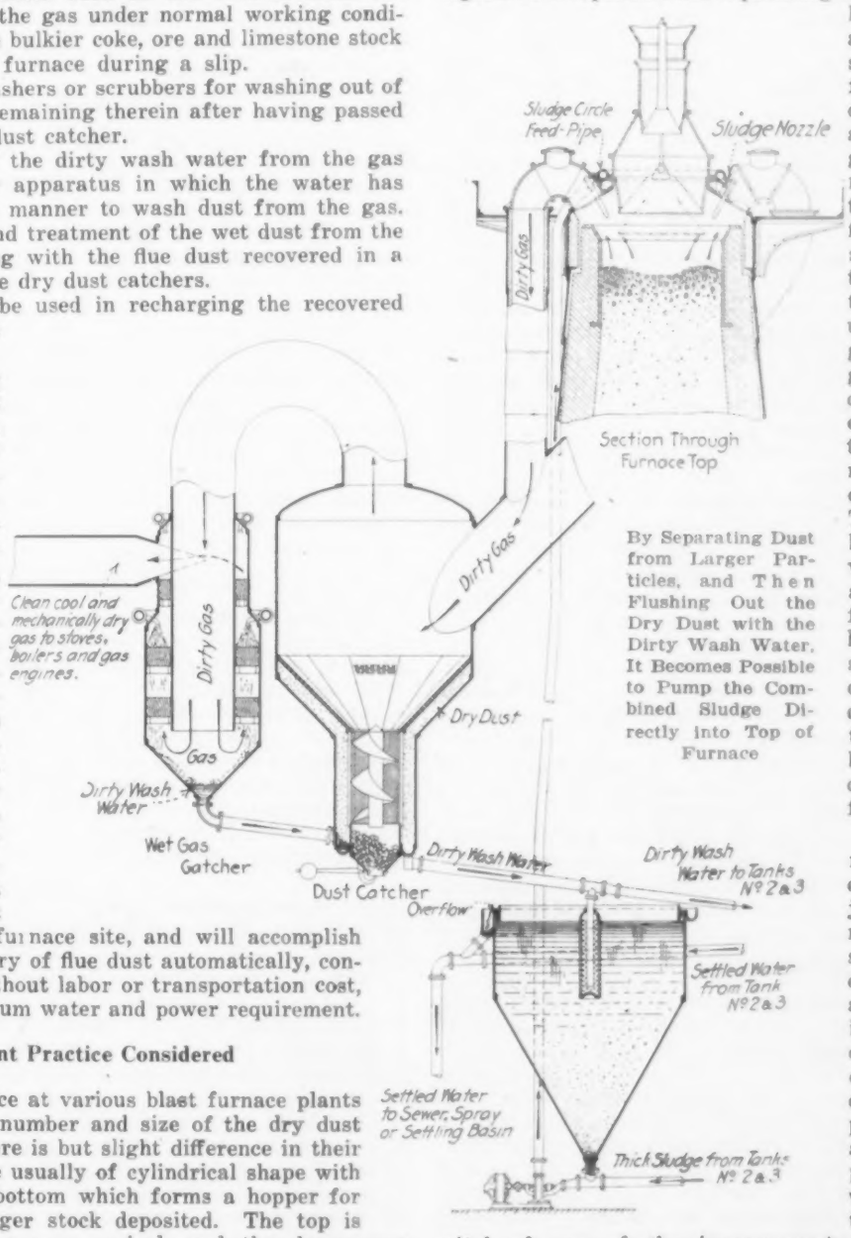
5. Method to be used in recharging the recovered flue dust into the blast furnace.

The foregoing considerations will be taken up in order with a view to outlining present practice, pointing out imperfections and suggesting improvements, and with the further object of accomplishing a coordinated arrangement of improved apparatus which will satisfactorily and effectively recover and recharge into each particular furnace practically all flue dust produced by that furnace, at the furnace site, and will accomplish this direct recovery of flue dust automatically, continuously and without labor or transportation cost, and with a minimum water and power requirement.

Present Practice Considered

Though practice at various blast furnace plants differs as to the number and size of the dry dust catchers used, there is but slight difference in their design. They are usually of cylindrical shape with inverted conical bottom which forms a hopper for the dust and larger stock deposited. The top is usually dome shape or conical, and the downcomer or downcomers which conduct the gas from the top of the blast furnace, enter through the top or the side of the dust catcher. The gas outlet connection may occur at either place, but preferably opposite, or as far from the inlet or downcomer connection as possible. There is but little advantage gained by either arrangement, however, as the amount of dust precipitated in the dust catcher varies in accordance with the velocity and dust content of the gas passing through it, and the larger the dust catcher the lower the velocity of the gas moving through it and the greater the dust precipitation therein.

Not much has been done toward accomplishing anything within the dust catcher other than what has just been related; but the dry dust catcher offers great possibilities in the economic handling of flue dust if designed as a separator for separating flue dust from the larger coke, ore and limestone stock discharged from the furnace during a slip. Separation of these grades would permit the fine dust to be sluiced or flushed out of the separator with the same water that is previously used to wash the gas in the wet gas washer, thus combining all flue dust and necessitating but one method of handling thereafter. The larger stock brought down within the separator is freed from dust and held within the separator until drawn off into cars, and taken to the ore or coke bins to be recharged into the furnace.


Sludge Circle Feed-Pipe
Sludge Nozzle
Dirty Gas
Section Through Furnace Top
Dirty Gas
Clean cool and mechanically dry gas to stoves, boilers and gas engines.
Dirty Gas
Dry Dust
Gas
Dirty Wash Water
Wet Gas Catcher
Dust Catcher
Dirty Wash Water
Dirty Wash Water to Tanks Nº 2 & 3
Overflow
Settled Water from Tank Nº 2 & 3
Settled Water to Sewer, Spray or Settling Basin
Thick Sludge from Tanks Nº 2 & 3

By Separating Dust from Larger Particles, and Then Flushing Out the Dry Dust with the Dirty Wash Water, It Becomes Possible to Pump the Combined Sludge Directly into Top of Furnace

The improvements in dust catcher design just proposed are met in the design shown in the drawing. The first and greatest saving in cost of of handling flue dust and recovery of bulkier stock is possible of realization in this improved design, which may be termed the most vital of any of the improvements proposed, as it pre-determines the extremely simple methods of handling the flue dust in wet form made possible by the separating and dust flushing features of the design.

Dust Precipitation in Installments

At some plants further efforts are made to precipitate dust in the dry state, between the dry dust catcher and the wet gas washers, by installations of secondary dust catchers, dust legs or pockets and dry whirlers; all of which catch some dust as the gas passes through them. This would occur, however, if an almost infinite number of pieces of apparatus were used to recover

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the dust in a dry state, and it is for this reason that recent practice has inclined toward the omission of all dry dust catching devices between the first dry dust catcher and the wet gas washer, and installing the gas washer as close to the dust catcher as possible, so that the connecting gas main may be shortened to the minimum and otherwise arranged to be self cleaning, in that no dust will find a lodging place throughout its length.

Types of Gas Washer Design

Wet gas washer design has in the past covered widely different views on various types of apparatus for accomplishing the washing of dust from blast furnace gas, using water as the washing medium. All these types of washers may be roughly arranged into two groups: power-driven and stationary washers. Of the power-driven washers the Thiessein is a good example, and is one of the few designs of power-driven washers remaining in practical use; and this for secondary or final washing only, it being entirely out of consideration as a primary washer or scrubber.

In the stationary group of washers the rain or spray type, and the baffle types, form two subdivisions. By rain or spray type is meant those washers, or scrubbers, as they are more often called, wherein a rain or spray of water is dropped from a considerable height within a tower through which the gas travels upward, the dust carried by the gas being washed out by contact with the spray of water.

Within the baffle type washers sprays of water are directed on baffles made of wood or metal, the surfaces of which serve to retard the water as it falls from top to bottom of the scrubber. The baffles are so arranged that they split up the gas body as it travels upward through the scrubber and thus cause the gas to come into more intimate and positive contact with the wet surfaces of the baffles, on which much of the dust impinges and is then washed off by the continuous spray of water directed on them.

Of the two types of stationary washers just described, the baffle type has proved to be of greater efficiency for two reasons. In the rain or spray type scrubber there are usually heavier sprays of water required to break up the gas body and penetrate it. Gas in moving through a spray acts much like wind with rain in a storm, a strong wind often being seen to blow sheets of rain at a sharp angle to the perpendicular. Gas acts likewise in a spray type scrubber, except that, being confined within the scrubber, the gas tends to travel through the spray. In a well arranged baffle scrubber, on the other hand, channelling is practically eliminated, as the gas is split up into thin bodies which are compelled to travel between two wet walls which prevent their surging or channelling. A further advantage is gained by the baffles in that they retard the fall of water, thus bringing a given quantity of water into longer contact with the gas, and causing it thereby to wash out more dust from the gas.

Action of the Baffles

The nature and position of baffles within a gas scrubber are determined by simple considerations. If a wet board or sheet of metal one foot square is projected into a moving body of dirty gas, with its greatest area at right angles to the direction the gas is moving, it will be found to pick up no more dust from the dirty gas than if turned ninety degrees to the original position, while the resistance to the moving body of gas, with the baffles in the first position, would be much greater. It is for this reason that baffles are set edgewise or parallel to the direction of gas flow.

After exposure of one square foot of wet baffle surface to a body of dirty gas in the manner just described, it will be found to have collected a certain amount of dust in a given length of time. If twice the area of baffle surface is exposed to the dirty gas about double the amount of dust will be collected, and by provision of ample baffle surface a given volume of gas, of given dust content, is continuously cleaned or washed of dust by the action of the water spray directed on the baffles.

In the selection of materials for baffles, wood is usually chosen, mainly because it is a cheaper material and because it can be readily built into the scrubber. Wooden baffles, however, have some serious disadvantages. One of these is their bulk. They are usually about an inch thick, and as the spaces between baffles cannot be much less than an inch, because of the tendency to warp and thus close the openings between them, it is readily seen that baffles of wood occupy one-half of the cross sectional area of the scrubber in which they are placed. On this account a scrubber shell is necessary of twice the area that would be required if thin plates or sheets not over 1/32 in. thick were used. This is a very serious consideration when arranging spray water distribution, as the area over which a given quantity of water is to be sprayed is about twice as great with wooden baffles as would be required with thin sheet baffles.

A further objection to wooden baffles is their liability to being over dried and warped if the water should go off the scrubber while in operation, while at least one instance is known where the baffles have taken fire during construction, causing the scrubber shell to buckle badly.

Drying the Scrubbed Gas

After having been washed by contact with wet baffles and spray, the gas has been cooled and cleaned of practically all dust. But on leaving the scrubber it carries with it considerable entrained moisture in the form of fine water mist, which has been picked up and carried along by the gas as it moves out of the scrubber at high velocity. It is, therefore, very desirable to remove this moisture, if possible, within the scrubber, and much of it may be removed by causing the gas to impinge on baffle surfaces not sprayed constantly with water. The moisture in the gas coming in contact with the baffle surfaces gathers on them, and forming in drops, trickles down and off the baffles. For removal of moisture from gas in this manner the wooden baffle is not well suited because of its bulk, and as considerable drying area is necessary, it would be impractical to consider this construction within a scrubber.

Disposal of Washer Water

Probably as great a problem as that of gas washing itself is met with in considering proper methods for the disposal of dirty water from the gas washer. Government restrictions have in the past, and will in the future, make it more imperative that water which has been used in blast furnace gas washers be first settled in properly constructed tanks, basins, or ponds of sufficient size to accomplish the retention of most of the dirt from the water before it is turned into public watercourses, where it rapidly clogs or obstructs the channels, the yearly deposits from one furnace alone being enormous.

From an economic viewpoint it is even more important that the gas washer water should be made to yield up its valuable burden of latent raw material. Several different designs of settling basins are in use, in most cases it being the practice to divert the water from all scrubbers to one basin. For this reason the basin must be of such large dimensions as to necessitate its being located some distance from the furnaces or scrubbers.

The basin may be of single compartment construction or, more usually, of two or more compartments, which permit of one being cleaned of the deposited flue dust sludge while the dirty wash water flows through the other. Cleaning or dredging is done with a locomotive, or overhead electric crane. A more recently developed design of settling basin provides settlement and cleaning continuously in one circular basin, the cleaning being accomplished by use of a bottom scraper or plow mechanism which works the sludge toward the center of the basin, from which point it is then pumped.

At plants where it is the practice to recharge the wet sludge into the furnace, it would be a decided advantage to settle the dirty wash water in two or three tanks, the diameters of which need not be over twenty-two feet with a depth of ten feet. Settling tanks of this size could, in most plants, be located near the furnace.

The tanks should be of deep conical bottom construction, in which sludge could settle to considerable depth, for the greater the depth attained the more dense and less watery the sludge becomes. With this arrangement sludge at almost any desired consistency could be tapped off at the bottom of the tank and charged as desired.

Handling the Entrained Dust

Where it is regular practice to charge into the furnace all flue dust recovered in the wet form, and where it would be desirable to charge in the wet state all dust produced, the problem is further complicated because of the dust recovered dry, which amounts to more than that recovered wet. Dry dust at some plants, and both wet and dry dust at others, is transported to a sintering or briquetting plant, and after treatment, is returned to the furnace and charged in the usual way. Consideration of the sintering or briquetting processes for treatment of flue dust is obviated, however, if the dust is all combined and brought down in the wet form as suggested above, which leaves for consideration only the method of charging the flue dust into the furnace.

Where flue dust is treated by either the sintering or briquetting process, the method of charging is simple. The product is dumped into the stock bins at the furnace, charged into the stock larry car and thence into the skip car, as is all the coke, ore and limestone charged into the furnace.

Objections to Charging Wet Flue Dust

Where all flue dust is to be brought down in the wet form, however, the method of charging is a matter of serious consideration. It has already been stated that at some plants wet flue dust is charged directly into the blast furnace without being either sintered or briquetted. This practice is not accomplished without considerable cost of handling and other inconvenience, and thus far no standardized system of handling or charging seems to have been developed.

At some plants both dry dust and all ore charged into the furnace are wet down with water just after being dumped into the skip car and before it is hoisted to the top of the furnace. An objection is always raised to this practice, however, because of the fouling effects of wet stock in the skip car and on the charging mechanism; but where the recovery of all flue dust in wet form is accomplished as previously suggested, the charging of wet sludge is greatly simplified by application of the hydraulic system for lifting the wet sludge through a pipe to the top of the furnace, where it can be easily distributed within the furnace through a circle pipe and specially designed nozzles which pierce the top cone of the furnace and introduce the sludge without bringing it into contact with any of the charging mechanism.

The foregoing description of methods, practice and apparatus, with suggestions for improvement, is based on actual operation, recent development or experiment. The design of apparatus required to accomplish the suggested improvements, however, is represented in the accompanying drawing and now described.

Special Dust Catcher Design

The dust catcher shown is of about the usual design, except that it has, about 18 in. above and inside its conical bottom, a false conical bottom of plates having ¼-in. slots so arranged as to allow all fine dust and particles smaller than ¼ in. to pass from the upper to the lower chamber, which chambers are formed by the false bottom. The dust after passing through the false bottom drops into the true bottom of the dust catcher, and slides thence into the dust flushing well, where it is flushed out by the dirty wash water from the gas washer.

Any particles brought down in the dust catcher that are too large to pass through the ¼-in. slots in the false bottom simply slide down the false bottom into the helical chute in the bottom center of the dust catcher-separator. This helical chute is encased in a cylindrical cage of bars with ¼-in. spaces between them. In ordinary operation this chute would not be required, but in cases of bad furnace slips, when tremendous quantities of coke, ore and limestone with much fine dust are suddenly thrown into the separator, much of the fine dust would remain unseparated except for the presence of the helical chute, down which all this stock must pass on being dropped out of the dust catcher-separator, into cars in which it is carried to the stock bins. The chute inclines all material rolling down it against the encaging bars and the fines, or particles smaller than ¼ in., sift out between the bars into the flushing well.

By this separation much valuable stock is immediately made available for recharging into the furnace, and without cost for screening or otherwise handling, except transportation to the stock bins. The fine dust separated within the separator is carried out of the flushing well by the water from the gas washer, thus eliminating all cost of handling and treating in the dry state.

The Gas Passes Into the Washer

After dropping much of the heavier dust in the separator, the gas passes through a self-cleaning gas main into the gas washer. It enters through the drop leg of this main, which drops vertically into the center of the washer. The purpose of this construction is to accomplish perfect gas distribution on entering the washer and drop a great part of the heavier dust—still carried by the gas—immediately into the bottom of the washer. A further object is to permit of the washer being used as a water seal gas valve. By this arrangement the transverse sectional area of the washer is lost to gas cleaning to the extent of the transverse sectional area of the gas main dropping through it, but the thin corrugated sheet metal baffles suggested occupy so little of the transverse sectional area of the washer, effective for gas washing, that the shell diameter of the washer may be even less than scrubbers in which wooden baffles are used. Furthermore, the area over which water spray must be distributed is so much less than that of larger diameters that a material increase in gas washing efficiency is obtained.

On entering the washer through the open end of the drop leg of the gas main, the gas turns an angle of 180 degrees and rises uniformly up through the torrent of falling water, and begins to pass through the lower set of baffles, which are of thin corrugated sheet metal and spaced about ¾ in. apart, being held thus by simple indentations of the corrugations which occur at odd points on the sheets.

Cleansing Effect of the Baffles

In the lower baffles the gas is subjected to 80 sq. ft. of cleaning surface for each sq. ft. in the area of the entering pipe, using a standard 2 ft. 3 in. width of corrugated sheet. The gas is thereby cooled and cleaned of the heavier dust, which, combining with the water flowing down the surfaces of the baffles, is continuously washed into the bottom, and thence out of the gas washer.

Still rising upward, the gas passes through a second set of baffles similar in construction to those just described, but spaced ⅜ in. apart. In passing through these baffles it is subjected to 160 sq. ft. of additional cleaning surface, and is here thoroughly cleaned of dust and cooled to within a few degrees of the entering wash water.

Drying the Gas

The gas travels through these baffles at about half its velocity in the entering main, but above the continuous spray nozzles shown on the washer the shell is contracted to a smaller diameter, which increases the gas velocity to that in the entering main. As has already been described, this increased velocity of the gas causes more forceful impingement of the water mist it has picked up in the lower part of the washer, against the dry or unsprayed baffles set in this section of the washer. These baffles are spaced about 3/16 in. apart and the gas in passing through them is subjected to 320 sq. ft. of drying surface. As the mist continues to impinge on the baffle surfaces it forms into drops and flows down their surfaces and into the lower part of the washer.

Cleaning, cooling and drying the gas of entrained

moisture is in this manner accomplished in one piece of apparatus, thus providing gas which may be carried through comparatively small unlined mains to the stoves, boilers, or gas engines. The compact baffle arrangement permits the bottom of the washer to be raised to a level sufficiently high to allow the dirty wash water flowing from the washer to enter the dust catcher-separator, where it picks up additional dust, and goes thence to the settling tanks.

Disposal of the Dirty Wash Water

Dirty wash water carrying all dust brought down in the gas washer and dust catcher is thus run by gravity through straight pipes to the settling tanks, which for a modern furnace plant would be three in number, and about 22 feet in diameter, or 20 feet square, with a depth of about 10 feet on the sides, which would permit of their being located in most furnace plants in line with the dust catcher and beyond it. The water enters the tanks through a seal pipe, which prevents gas at all times from escaping from the dust catcher with the water. The water passes out into the tank through a perforated distributing pipe and thence travels at an ever decreasing rate to the side wall of the tank, where it overflows. In passing slowly through the tank, about 90 per cent of the flue dust in the water is precipitated and settles into the steep conical bottom of the tank in the form of a silt-like deposit, or sludge. The water flowing over the weir wall of the tank drops into a trough running around the tank and thence flows through a pipe to the sewer, which may carry it to a nearby stream or settling basin, or to a spray pond if the same water is to be used over again.

As the sludge settles to the bottom of tank to increasing depths, water is to a great extent displaced by the pressure of the upper mass of material, so that at the bottom of the tank where it is removed through the sludge pipe the sludge would, under proper working conditions, contain not much in excess of 35 per cent water, which would permit of its being immediately charged into the furnace.

The nature and consistency of the recovered sludge make it possible to charge hydraulically with a high-head centrifugal sludge pump, with a power requirement of not more than 5 electrical hp. running continuously.

Charging the Sludge Into the Furnace

The sludge is collected and pumped through comparatively large pipes to reduce abrasion. It enters the top of the furnace through a circle pipe and specially designed nozzles piercing the top cone of the furnace. The nozzle openings are flat and are of sufficient number to distribute uniformly a ring of sludge onto the stock just under the large bell. This sludge ring distributes itself over the stock and the new charges of stock are dropped in on the sludge layers. Excess moisture in the sludge is therefore rapidly absorbed by upper and lower stock layers, thus accomplishing a wetting down of all stock and lessening dust production.

Advantages of Proposed System

The advantages gained by this system of flue dust recovery are:

1. Separation of fine flue dust from the bulkier stock is immediately accomplished, and the large stock made available for charging into the furnace.
2. The fine flue dust is flushed out of the dust catcher-separator continuously by the same wash water that has previously been used for gas washing.
3. The gas is thoroughly cleaned, cooled and mechanically dried, and may be conducted through relatively small unlined mains to small-checker stoves, boilers, or gas engines.
4. The water used in the gas washer carries all dust from both washer and separator to the settling tanks, where all but about 10 per cent of the dust is recovered from the water in wet form, thus eliminating all cost of handling and treating contingent on recovery of dust in dry form, or when recovered part wet and part dry.
5. All dust recovered in wet form is immediately available for charging into the furnace, eliminating the necessity of treatment by either the briquetting or sintering process.
6. Flue dust in wet or sludge form may be pumped into the top of the furnace, accomplishing the wetting down of all stock and consequent retention of much of the dust that would otherwise be blown out of the furnace.
7. Recovery of flue dust is accomplished at each furnace, making possible the recharging of the same flue dust produced by that furnace.
8. The dirty gas washer water is sufficiently purified to permit of its being run into a public watercourse.
9. Water, power, transportation, labor and operating costs for this recovery process are less than that of any other.
10. The first cost of constructing a direct recovery plant is negligible compared to that of plants for treatment of flue dust by any other process.

A Problem in Nickel Steel

The following narrative, contributed by A. J. Wadhams, assistant general superintendent, International Nickel Co., Bayonne, N. J., has been received from the Engineering Foundation, New York, as illustrating the accidental element in research.

Before nickel in alloy steel was an established fact, it was introduced in a rather unusual manner.

In the early eighties a paper on possible uses of nickel steel for naval ordnance was read in London and found its way to Washington. At that time there was a bad yellow-fever epidemic in New Orleans. Attempts to stamp out the disease by known methods proved ineffectual. Someone suggested that, as the yellow-fever germ could not live at a low temperature, the epidemic might be stopped by isolating the patients and keeping them at a sufficiently low temperature. A hospital ship equipped with refrigerating apparatus, moored in the Mississippi River, was the plan decided upon.

Some studies of refrigerating machinery showed that one of the difficulties was to get a metal which would withstand the corrosive action of ammonia gas. The committee of Congress which had the matter in charge decided that the new alloy known as nickel-steel was the best metal. Thereupon bids were sent out for nickel. It was found that the world supply of nickel, which up to that time had been used principally for coinage, was so limited that some new supply would have to be found to meet the demand for this hospital ship.

Col. R. M. Thompson, at that time proprietor of the Orford Copper Co., had on his hands a so-called copper ore, from the Sudbury district of Canada, which he found contained a substantial amount of nickel. There were no known methods about 1880 for separating nickel from copper as found in these ores. Here was an ore which contained the nickel the Government wanted for the hospital ship, but no way to get it out. Having, however, the courage of his convictions, Colonel Thompson went to Washington and agreed to supply the nickel.

A small blast furnace, through which these ores were smelted, was tried with every known flux which could be brought to Bayonne, N. J., with no results. Finally it was agreed that the general accumulation of miscellaneous ores, fluxes and other materials would better be cleaned up before any further attempt was made. In the process of cleaning up Colonel Thompson had pointed out to him by one of his superintendents a pot of metal which had separated when dumped. No serious thought was given to this incident, but it was sufficiently suggestive to lead to sampling. The result showed the nickel in the bottom and the copper in the top.

The question then was, Which and what of the ingredients put through the blast furnace, in the process of cleaning up, were responsible for the result?

By a process of elimination the proper combination was established. This separating process was known from that time on as the Orford process.

American Industry's Part in the War

Review of Activities by Bernard M. Baruch with Recommendations to Promote Co-operation of Business and Government—Price Fixing Discussed

WASHINGTON, March 22.—Recommendations carried in the final report of the War Industries Board, made public last Sunday through the United States Council of National Defense, which has had charge of the records and files of the board since shortly after the armistice, really are a repetition of previous ones. Nevertheless they are interesting and their importance is emphasized by reason of purposes which the Harding Administration has in mind with regard to reorganization of Government departments and co-operation with financial, trade and industrial enterprises of the country. No pretense is made by the new Administration that a number of its plans are not constituted of recommendations previously made, which are being revived and amplified with the intention of translating them into effective operation.

The final report of the War Industries Board, issued in book form from the Government Printing Office, is entitled "American Industry in the War," consists of 150,000 words, and has been completed by Bernard M. Baruch, who was chairman of the board, in compliance with a promise made to President Wilson and supplements conclusions of the general work of the board, reported in December, 1919.

Change of Attitude

Of great interest is the recommendation for encouragement of permanent intimate combinations or associations of industry under Government supervision, involving a decided change in the attitude of the Government toward such groupings. It is suggested that, as a result of the successful uniting of Government and business under the War Industries Board for national purposes, there should be established some sort of Government tribunal which should sanction in the public interest the intimate associations of industries which resulted in such economies and enlargement of production during the war. The idea in mind is civic measure legislation permitting the continued functioning of the industrial groups represented by the war service committees of more than 350 industrial groups.

Greatest Public Benefit

"These associations, as they stand," says the report, "are capable of carrying out purposes of the greatest public benefit. They can increase the amount of wealth available for the comfort of the people by inaugurating rules designed to eliminate wasteful practices attendant upon multiplicity of styles and types of articles in the various trades; they can assist in cultivating the public taste for rational types of commodities; by exchange of trade information, extravagant methods of production and distribution can be avoided through them, and production will tend to be localized in places best suited economically for it."

While the continuance of these associations in peace is recommended as an economic reform pure and simple, it is pointed out that their existence "would be of incalculable aid to the supply organizations" in time of war. As the associations have power for evil as well as good, such, for example, the report says, as unduly restricting production and lifting prices, they must be under strict Government control. It is maintained that the agency of such control should act both positively and negatively to the end that the good of association might be encouraged and the evils prevented and that economies of co-operation may be reflected in reduced costs to the consumers rather than in excessively enhanced profits.

Permanent Organization

A concise recommendation is made also for the maintenance of a skeleton organization along the lines of the War Industries Board which, by reason of its form and peace-time contact with industry, would be capable of immediate expansion and action in the emergency of another war. Mr. Baruch says that there ought not alone to be a mobilization of man power but of things and of dollars. The recommendation loses none of its vital character because it has been made so often that it is historic. It involves the question of the Government keeping in touch with industry, so that the resources and facilities of the nation, adaptable to war purposes, should be an accurately known quantity and the nucleus of their emergency control be at all times ready to expand. It is further urged that certain war industries should be encouraged to maintain skeleton organizations through which they could rapidly expand the production of guns, airplanes, munitions and other direct military equipment. The other important recommendation is for stimulation of the domestic production of such military necessities as nitrogen, coal tar derivatives, etc., of which, the report says, there is a complete lack or a serious shortage.

The Priority Policy

While the book gives much credit to the board's functions in solving the complex industrial mobilization through introducing order and definiteness into requirement programs and systematically comparing them with reliable inventories of resources and facilities, the emergence of the priorities principle and its elastic and adaptive application are held to be the greatest achievement. It was "destined to become the most characteristic and dominating feature of the whole scheme of war-time supervision over the industrial forces." Priority, it is stated, established order in production and delivery, stabilized prices, supplemented price-fixing and put teeth into all the regulations of the board. The rules and workings of the priorities scheme, defined as being simply a vast and smoothly working arrangement by which war material was produced according to priority of need, are given in detail.

The success of the conservation program, says the report, was largely dependent on the establishment of priorities. It reached hundreds of industries, thousands of plants, and millions of consumers. In the canning industry alone, it is stated, it saved 260,000 tons of tin plate annually through substitutions. Assuming that this figure is correct and estimating tin plate capacity of the country at 42,000,000 base boxes annually, the saving would represent slightly less than 12½ per cent of the annual production or equivalent to approximately six weeks' capacity operation. However, the report apparently is intended only to show possibilities in emergencies and in this respect not to recommend such application of substitutes in peace-time, which, far from being feasible in peace-time, would be anything but a program of conservation. The so-called substitutes in reality were only temporary expedients, not at all suitable for permanent use and no better proof of this is evident than the great expansion of the tin plate industry and the constantly increasing use of tin plate containers.

Savings Effected

Elimination of the use of tin in silk is declared to have saved 50 tons of tin. Packing certain dry goods in bales instead of boxes is credited with saving 17,312 carloads of freight space, 140,000 cartons and nearly 500,000 wooden packing cases. The simplification and restriction of models and fads throughout industry and the abolition of useless services and practices effected such economies in labor, materials, power and transportation as to promote materially the efficiency of the war machine and to reveal for the first time "the ap-

palling extent of waste in industry and commerce. So striking were the economies effected by the conservation division that it is considered that they point the way to future reform in productive and distributive progress that will no doubt result in providing abundantly for elemental comforts of every person in the land."

Idea of Standardization

This progress necessarily involves the idea of standardization, which Secretary of Commerce Herbert Hoover has already discussed with the purpose in mind of making it practical and it is altogether likely that this and other recommendations, though perhaps modified, made by Mr. Baruch, will be put into effect. It is realized that conservation in war time is entirely different than it is in peace time and, as a matter of fact, is not an analogous term. Standardization is a problem that is recognized as one calling for careful study. It is a question of what models will be standardized and what ones discarded, the latter entailing the uselessness of mechanical organizations, such as those relating to dies, gages, jigs, etc., which would be outside the standardization plan.

This would mean loss of investments, and actual trade and unquestionably would be fought vigorously by those adversely affected, and in view of recognition of this problem it is not proposed to work injury to any organizations.

Chaotic Conditions

The chapter of the Baruch report on price-fixing describes the chaotic conditions brought about by Government buying on an unprecedented scale in a limited field of supply and points out that the corrective action of the law of supply and demand was non-existent in the conditions that prevailed. Under these circumstances, the United States made its first experiment in price-fixing. The report holds that price fixing, with little or no direct legislative authority, was necessary not only for the protection of the Government and the public against exorbitant prices, but as a means of stabilizing industry and stimulating, through assured fair prices, abundant production. The patriotic submission of industry, it is stated, is considered a prime factor in its success. Legislation that now is pending in Congress, and, it is said with the approval of the Administration, calls for a centralized bureau for Government purchases of supplies, is intended to be a means of great saving in money.

Reductions of Steel Prices

The report states that in steel, for example, the result of price-fixing was to reduce ship plates from $12 to $3.25 per 100 pounds, pig iron from $60 to $33 per ton, coke from $12.75 to $6, copper from 37c. to 16.67c., 23.5c. and 26c., zinc from 22.50c. to 12c. The report does not attempt to estimate the savings either to the Government or the public from price-fixing, but independent estimates have placed the saving in iron and steel alone at more than $3,000,000,000. Without any desire to criticize Mr. Baruch, who did a really great work, it is just as well that no total estimate was attempted if the figures he carries on iron and steel are an indication of those he would cite in other lines, for plainly they are incorrect. The going prices on iron and steel at the time the first prices were fixed on Sept. 24, 1917, as shown by THE IRON AGE, were not so high as the levels given in the report. Ship plates, instead of being 12c., were 8c. base, Pittsburgh, and basic pig iron, instead of being $60, was $42, Valley furnace, though it had been as high as $48. The figure as to coke (furnace) is practically correct, for the price on Sept. 20, 1917, was $12.50, Connellsville ovens, as compared with $13 the preceding week.

February Fabricated Steel Business

In February 25,600 tons of fabricated structural steel were contracted for throughout the United States, equivalent to 14 per cent of the capacity of the bridge and structural shops of the country. These statistics were compiled by George E. Gifford, secretary Bridge Builders and Structural Society, New York, and show that February's total was the lowest in nine years for which there are records, except the months of January and February of 1919, when the amount of business averaged 22,000 tons.

Railway Supply Makers Postpone Meeting

After careful consideration and consultation with members of the organization, the Railway Supply Manufacturers' Association has decided that it will be the part of wisdom and good business judgment to postpone the meeting and exhibit which were to have been held in June, 1921, at Atlantic City. The executive committee has adopted resolutions setting forth that during the present depression of railroad and general business and the attendant desire and demand to curtail expenditures in every possible direction in order to strengthen the existing financial situation, the postponement of the convention and the exhibit is considered desirable. The committee also expresses confidence that it will be warranted in resuming plans at a later date for the 1922 exhibit as in former years.

Meeting on Industrial Relations

An industrial relations night is to be held by the New York sections of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers in a joint meeting in the Engineering Societies Building, New York, Friday evening, March 25. The subjects include "The Social History of Labor Organizations," by Dr. F. H. Giddings, Columbia University; "The Rise of Industrial Workers in Organized Society," by Dr. Ira N. Hollis, Worcester Polytechnic Institute, and D. S. Kimball, dean of the Colleges of Engineering, Cornell University; "Recent Legislative Enactments Affecting Industrial Relations," by Dr. S. M. Lindsay, Columbia University; "Developments in Organizing Personal Relationships in Industry," by L. P. Alford and E. W. Tree, *Management Engineering*, and "Human Tendencies That Must Be Recognized in Industrial Relations," by A. L. DeLeeuw, consulting engineer, New York.

The Magnesite Deposits of Washington

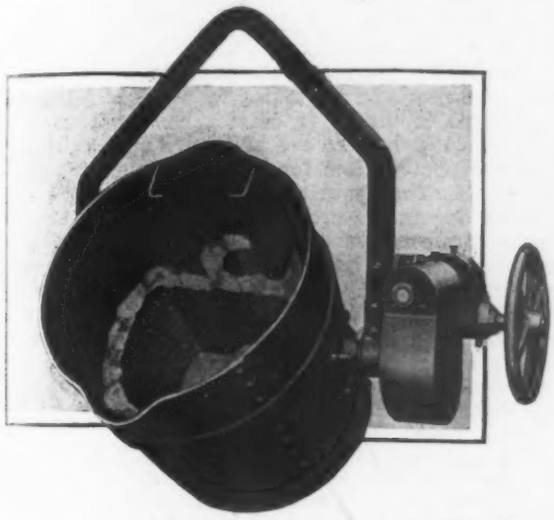
SEATTLE, March 15.—The magnesite deposits of this State, if properly developed, will make the United States independent of Europe in case of another war, according to John T. Burns, assistant secretary of the American Mining Congress, in an address here before mining men at the Chamber of Commerce. Mr. Burns is urging co-operation of this State in making a creditable exhibit of Washington and Alaska mineral products at the mining congress at Chicago next October.

A noteworthy paper on fuels, discussing the so-called form-value of fuel as denoting a value due to physical condition or chemical composition of the latent heat energy in contrast with the thermal value of the fuel, was presented before the American Society of Mechanical Engineers last December. It has been reprinted and a copy can undoubtedly be had by addressing the W. S. Rockwell Co., 50 Church Street, New York. Among other things the paper included a remarkable chart drawn up by the Rockwell company covering factors that govern the selection of fuel for industrial heating operations.

The International Acceptance Bank, Inc., 31 Pine Street, New York, now reports among its stockholding banks the following in Europe: Nederlandsche Handel-Maatschappij, Amsterdam; Hope & Co., Amsterdam; Swiss Bank Corporation, Basle; N. M. Rothschild & Sons, London; National Provincial & Union Bank of England, Ltd., London; Aktiebolaget Svenska Handelsbanken, Stockholm; Skandinaviska Kredit Aktiebolaget, Stockholm, and Credit Suisse, Zurich.

New Teapot Spout Ladle

A recent improvement in teapot spout ladles is shown in the accompanying illustration. This design has the spout on the inside of the bowl, formed by the ganister lining allowing the trunnions to be placed nearer center line of the bowl, thus facilitating better balance and easier handling for pouring. Furthermore, the bowl of this ladle, being of one-piece riveted



New Whiting Teapot Spout Ladle with Spout Inside

construction, the tendency to warp out of shape from long usage is minimized. Either brick or ganister lining may be used, although the latter is somewhat easier to form.

This ladle is manufactured in 12 standard sizes, from 700 lb. to 10,500-lb. capacity in steel, by the Whiting Corporation, Harvey, Ill.

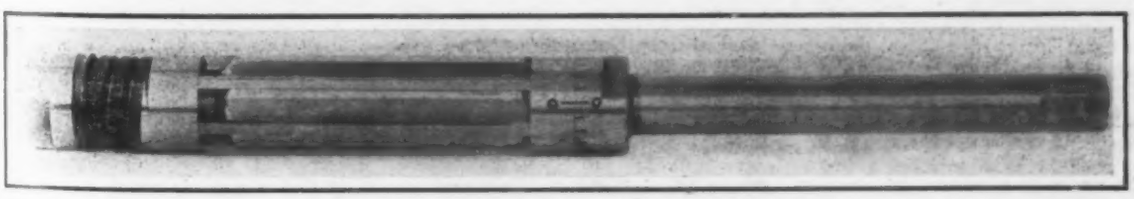
Strength of Punched Steel Strips

Sheet steel is used in aircraft construction to a large extent. To reduce weight, the sheets are often punched. An article by Karl Balaban in *Der Flug*, May, 1920, as abstracted by *Technical Review*, London, refers to experiments carried out by Dr. E. Preuss at the Technical College in Darmstadt, Germany, on the distribution of stresses over the surface of the punched out steel. It is shown that over the edge of the hole the stress may exceed the normal by over 200 per cent. Under these conditions it is of great importance that the hole should have a sharp edge free from tears.

New Adjustable Hand Reamer

A reamer, the size of which can be adjusted accurately by turning a nut with micrometer graduations, has been brought out by the Foster-Johnson Reamer Co., Elkhart, Ind., under the name of the Kylin Adjustable General Purpose Hand Reamer. The body is of large diameter, affording rigid support for the blades in the slots. Ample chip clearance is provided. A helical spring located on the lower end of the tool is designed to provide uniform compression, permitting closer adjustment and preventing springing or distortion of the blades.

The reamer is made in 13 sizes, of which the nominal diameter ranges from ⅝ to 1½ in. The small sizes have four blades and the larger sizes six blades.



Kylin Adjustable General Purpose Hand Reamer

Papers on Chemistry and Physics for Foundrymen

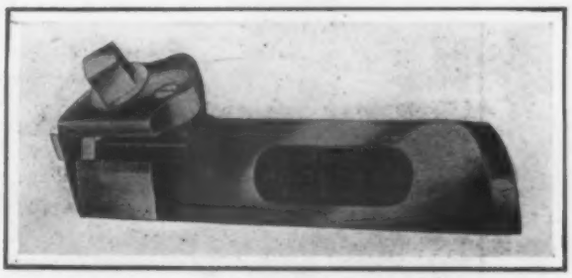
To extend the education of foundry superintendents, purchasing agents and all who work with and handle pig iron, coke, steel and related products Lewis R. Smith, resident manager Matthew Addy Co., New York office, is sending out a series of 50 papers, prepared by him, on "Elementary Chemistry and Physics." Mr. Smith explains: "As far as possible all matters of a too technical nature will be eliminated and only the practical result is aimed at in the course of our studies together. The lectures will be progressive and the subject matter of each paper, when understood, will make easy the next following paper. It is our object to give such scientific studies that by the time the half year lesson is read the student will be able to discuss the foundry problems in a clear and scientific manner."

These papers will be sent out about twice a month among the foundry trade in the New York territory. Mr. Smith has already received several letters indorsing the idea from men of the foundry trade.

Simmons Tool Holder

A tool holder intended to permit of the using of old tool bits usually discarded, reclaiming them, it is said, for use to the last fraction of an inch, has been placed on the market by the Simmons Economy Tool Corporation, Albany, N. Y., under the name of the Simmons hold-em-all tool holder.

Special grooving in the base of the holder is designed to eliminate rocking in the tool post. A variety



Uses Tool Bits That Are Usually Discarded

of sized bits may be used, as well as tools with straight or tapered shanks, rigidity being attained and chatter eliminated, it is said, by the oscillating movement of the clamping head on the binding screw and a supplementary screw which may be turned down by hand and used as a third point suspension.

When the bit is tightened in the holder, its center line is parallel with that of the binding screw, causing the cap of the holder to have a fulcrum, which is intended to eliminate any chance of the bits shaking or working loose. The lower lip of the holder is undershot to provide support for the cutting edge of the bit to its extreme point and still leave plenty of room for rake and chip clearance.

Besides the clamping action, the resting of the tool bit on a shoulder on the lower part of the holder is said to further provide against the bit coming loose or slipping out of place after the set screw has been tightened.

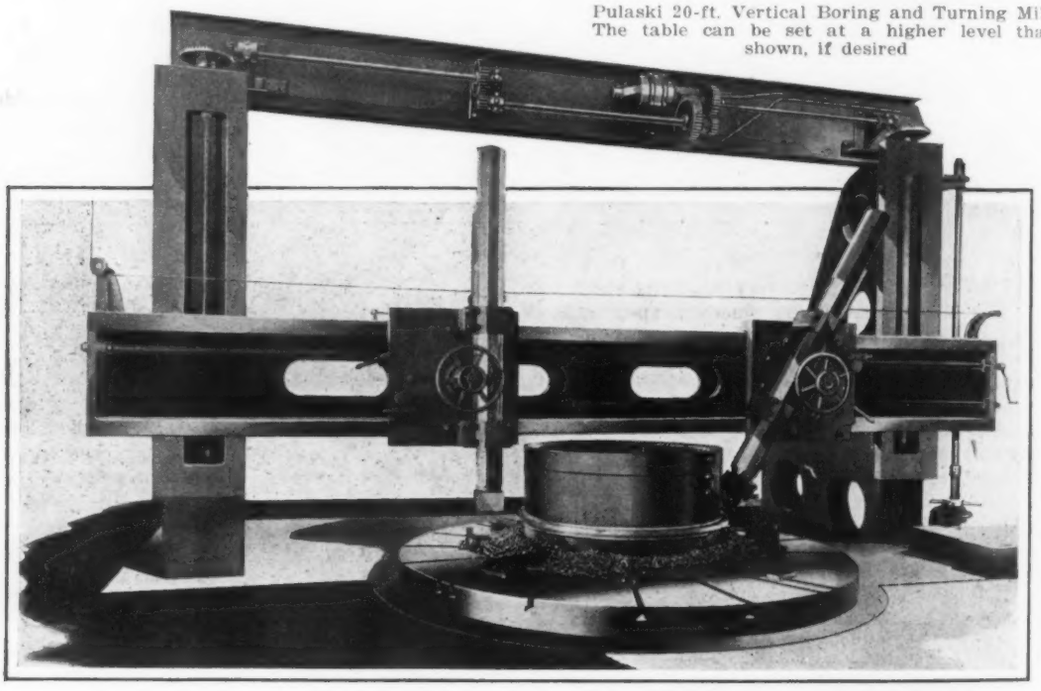
The holders are made from drop forgings and the binding screws are made considerably over-size. It is claimed that tool bits 7/16 in. long and pieces as small as 1/16 in. in diameter may be successfully used.

New Line of Vertical Boring and Turning Mills

The Pulaski Foundry & Mfg. Corporation, Euclid Avenue, Cleveland, has brought out a new line of vertical boring and turning machines, built in four sizes, from 16 to 22-ft. swing. They have been developed to meet a demand for a simple and rugged machine, of moderate price, that will take large work. It is expected that they will be of special interest to jobbing and repair shops, shipyards and large foundries that desire machines for doing rough machine work on castings but have hesitated to make the large investment usually required for machines of this size.

The illustration shows the 20-ft. machine which has an actual swing of 20 ft. 4 in., and which has been in operation at the plant of the Pulaski company for the past year. This machine was set with the table just above the floor line, and with the base and spindle housings in a room below the floor, but the machine can be set at a higher level if desired.

The machine has a 12-ft. table, which is the standard table diameter, and it is pointed out that this size table is convenient for a shop that handles both large and medium-sized work on the same machine, for it allows the operator to move around the machine without riding the table. Extension arms can be provided to carry extra large work, or a larger table may be provided if desired.



Pulaski 20-ft. Vertical Boring and Turning Mill. The table can be set at a higher level than shown, if desired

The base is of deep box construction, substantially webbed, and forms the upper spindle bearing and also the large annular bearing for the table. The housings are of the box girder form, double webbed and with no openings in the front. They are bolted to the bed and are firmly tied together at the top by a heavy brace. The table is deep and strongly ribbed. It is driven through an external gear of large diameter and is supported by a step bearing and a large diameter annular bearing, both running in oil. The table spindle runs in upper and lower bearings of liberal size. The upper bearing is bored out of the solid base. The lower bearing is carried in a large cone-shaped housing which is bolted to the bottom of the base. Each bearing is bushed with a taper split sleeve adjustable to take up wear. The end of the spindle rests on the step bearing fitted with hardened steel pintles flooded with oil. A large screw below the step bearing provides means for adjustment, and by which the load may be taken off the annular bearing when boring small holes and operating on light work at high speed.

The cross rail is of the box girder form of the fish belly type, with ample depth in the center to give rigidity. It is fitted with clamps to hold it to the face of the housings. The cross rail is elevated and lowered by a separate motor mounted on the housing brace, the power being transmitted through a train of gears to two cross rail elevating screws in the housing. These screws are carried on ball thrust bearings.

The two cross rail saddles are provided with taper gibs for taking up wear and for clamping the saddle to the cross rail when the boring bar is feeding. The saddles that carry the boring bars are wide and have a long bearing at the top for supporting the bars. The boring bars can be angled from the vertical up to 90 deg. in one direction and 45 deg. in the other direction.

The boring mars are octagonal in section, are of steel, with provision for taking up wear. A binder belt is provided in the lower bearing cap for locking the bar. The tool holders are of steel with provision for readily clamping tools for boring, turning and facing operations. They have taper shanks and can be easily removed for the insertion of special tools. Counterweights are attached to each bar and are so arranged that they will not interfere with the movement of the saddles.

The feeds are adjustable by means of a hand wheel from 0 to ¾ in. per revolution of the table. The feeds are obtained by variable friction drive and are continuous and independent of each head. Feeds are provided for vertical, cross and angular feeding.

The machine is direct motor driven, the power being transmitted through a speed box and change gears, giving 9 table speeds when a constant speed motor is used. It is stated that these table speeds will meet all ordinary requirements, but should additional speeds be desired they can be obtained by the use of a variable speed motor drive. The motor and speed box are mounted at the right of the operator's side of the machine.

The approximate table speeds are from 0.3 to 8 revolutions per minute. A 40-hp. motor with an approximate speed of 700 r.p.m. is used for all sizes. For elevating the crossrail a 10-hp. motor is used.

The investigation of steel rails made from sink-head and from ordinary rail ingots, conducted by the Bureau of Standards and reviewed in THE IRON AGE of July 1, 1920, is now available in printed form as technologic paper No. 178 of the Bureau of Standards, written by Dr. George K. Burgess. The 61 pages include diagrams, metallographic illustrations and tables to substantiate the conclusions, which, briefly, were favorable to the superiority of the sink-head ingot. The report is obtainable from the superintendent of documents, Washington, at 20 cents a copy.

Steel and Iron Prices in Belgium

Current Quotations on a Wide Range of Products and Ocean Freights from Antwerp

(Special Correspondence)

BRUSSELS, BELGIUM, March 2.—Dullness and hesitation still prevail. Buyers are influenced by the bad financial position in their respective countries, and they expect a further decline in prices. They are right because the present decline in the cost of fuel in Belgium will be followed shortly by a fresh fall in the prices. Quotations are necessarily shaky and hence the general abstention.

Makers are sacrificing the better part of their profit to keep going. In numerous instances, works are selling even below cost price to prevent stoppage. Labor understands the situation and seems to approve of reduction in wages. The price of food, that is, meat and cereals, has been reduced to a small extent, so that the workpeople will likely be willing to allow a proportionate cut in their wages.

Authoritative reports have been circulated here to the effect that the limit of 400 fr. (1.33c. per lb.) basis for steel will be reached very shortly. It seems likely in the face of the growing competition of foreign makers, who are still better equipped than we are for the output of several lines and large sizes. It is reported here that several blast furnaces are losing 75 to 80 fr. ($5.50 to $6) per ton of pig iron, and that the planned declines in the price of various commodities such as coke, railroad freight charges and labor will not relieve the cost of output by more than 50 fr. to the ton. Several continental makers are not at all optimistic in their view of an immediate future and a real improvement is not yet in sight. The proof that we are progressively reaching the limit of 400 fr. is that we have just placed a specification covering 700 tons of heavy steel beams at 47.50 fr. per 100 kg. (1.57c. per lb.), delivery f.o.b. Antwerp, within 3 weeks.

Pig Iron

The pig iron market has had to yield further under the pressure of makers in Lorraine and in Luxemburg, who have large stocks. Current prices on pig iron are as follows:

	Fr. Per Metric Ton	
Foundry No. 3	315 to 320	$23.00
Special Thomas	295 to 300	21.50
Ordinary Thomas	280 to 290	20.45
White iron	280 to 285	
Foundry No. 3 from Luxemburg	285	20.75
Foundry No. 3 from Lorraine	270 to 285	19.75
British hematite	220s. to 230s. c.i.f., Antwerp	

Semi-Finished Material

The Belgian ironmasters are commonly owners of only rolling mills and cover their needs in Luxemburg, where low prices are being offered. The following prices are for goods on cars, but we are of the opinion that the same terms could be obtained f.o.b. Antwerp, with a firm offer and for a large quantity:

	Fr. Per 100 Kg.	Per Metric Ton
Square blooms	40 to 41	$29.25
Billets	41 to 44	30.00
Sheet bars	44 to 45	32.00
Skelp	72 to 75	52.50
Blooms from Lorraine	37 to 40	27.00
Sheet bars from Lorraine, 150 x 8 mm. (6 x 5/16 in.) and up	39 to 41.25	28.50

Finished Steel Products

In finished steel the tendency is still weak. Foreign competitors obtain raw materials at lower prices than our home works so that the various concerns which remain in operation are really fighting in order to obtain the orders which are being put on the market from time to time.

As regards the rails, this material is rather firm and the rolling mills which are specializing in these sections have orders for some time. German competition is remarkably keen in drawn steel so that a fresh decline of 10 fr. had to be granted on the stuff. The following are prices on basic Bessemer steel, open-hearth steel being 30 per cent higher.

	Fr. Per 1000 Kg.	Cents Per Lb.
Steel bars	460 to 490	1.53
Small steel beams	500 to 510	1.67
Heavy steel beams	465 to 480	1.55
Rails	625 to 650	2.08
Angles and flats	490 to 510	1.63
Bars (below 1½ in. sq.)	515 to 520	1.72

Drawn Steel Bars

	Fr. Per 100 Kg.	Cents Per Lb.
Rounds	128 to 138	4.26
Squares	135 to 140	4.5
Hexagons	145 to 150	4.83
Spring steel	95 to 100	3.16

Electric Steel

Chrome nickel steel:		
N C R 1	280 to 290	9.3
N C R 2	375 to 390	12.5
N C R 3	455 to 470	15.2
Nickel steel:		
No. 2	265 to 275	8.8
No. 3	305 to 320	10.2
No. 6	420 to 440	14.0
No. 10	565 to 585	18.8
Carbon steel for tool making:		
C1 to C7	215 to 235	7.2
C8 to C12	265 to 275	8.8

Hammered steels are being charged an extra on the above prices, which are basis prices.

Iron Bars

Bar iron remains in good favor among foreign buyers. Levantine and South American clients are rather partial to iron sections. The tonnages booked in Belgium for iron bars are really astonishing. The best forging qualities are in great demand and British consumers continue substantial bookings for special purposes and bolt making. They claim that steel rounds are rather coriaceous for their purposes and they have some kind of prejudice against the steel rounds. The keenest competitor to iron bars is the open-hearth steel because the latter quality is more or less equal to the specific qualities of the iron bars and homogeneous iron. Prices are as follows:

	Fr. Per 100 Kg.	Cents Per. Lb.
No. 2 iron bars, base	50 to 51	1.67
No. 3 iron bars, base	52 to 55	1.73
Horseshoe iron bars	62 to 65	2.06
Iron hoops	70 to 75	2.33
Thin iron hoops (less than 1 mm., cold rolled)	112 to 120	3.73

Wire Nails and Bolts

The market in wire nails is typical of the slump in metals on the Continent. The makers are compelled to allow further reductions in the face of German competition. They had recently an opportunity to cover their needs in steel wire at good prices, but they have now to face further declines. The position is about the following:

	Fr. Per 100 Kg.	Cents Per Lb.
Nos. 1 to 6 gage, base	65 to 70	2.16

	Fr. Per 100 Kg.		Fr. Per 100 Kg.
No. 7, extra	2	No. 14, extra	22
No. 8, extra	4	No. 15, extra	30
No. 9, extra	5	No. 16, extra	50
No. 10, extra	8	No. 17, extra	70
No. 11, extra	12	No. 18, extra	100
No. 12, extra	15	No. 19, extra	125
No. 13, extra	18	No. 20, extra	170

	Fr. Per 100 Kg.	Cents Per Lb.
Iron round bars for bolt making	51 to 55	1.7
Steel round bars for bolt making	49 to 51.50	1.63

Sheets and Plates

Sheet orders received in Belgium do not cause any stiffening of prices, so that the market will not show

any sign of improvement for some time to come. For Bessemer steel sheets the works in Luxemburg quote 630 to 650 fr. base (or 2.1 to 2.2c. per lb.). The market in steel sheets and plates is about the following:

	Fr. Per 100 Kg.	Cents Per Lb.
Thick open hearth boiler plates..	83 to 90	2.77
Plates for stamping:		
6 mm. thick (¼ in.).....	138 to 145	4.6
5 mm. thick	145 to 150	4.8
4.5 mm. thick (3/16 in.).....	154 to 159	5.1

The qualities for stamping are supplied pickled and annealed.

	Fr. Per 100 Kg.	Cents Per. Lb.
Bessemer sheets, 6 mm. (3/16 in.) and up	63 to 66	2.1
Bessemer sheets 3 mm. (⅛ in.)..	66 to 71	2.2
Bessemer sheets 2 mm.....	68 to 72	2.37
Bessemer sheets 1½ mm.....	70 to 75	2.33
Bessemer sheets, 1.2 mm.....	73 to 76	2.43
Bessemer sheets 1 mm.....	76 to 81	2.53
Bessemer (thin) sheets, 0.8 mm...	83 to 86	2.77
Bessemer (thin) sheet 0.5 mm. (0.2 in.)	93 to 96	3.1
Polished steel sheets for automobile construction, aviation, etc..	123 to 130	4.1

Electrical sheets for dynamo construction, electric motors, etc., can be offered also for export, but production has only been started since the armistice.

Fabricated Steel

It has been reported that Belgian works specializing the railroad material and locomotives had received a portion of the tender of locomotives for Spain. We have no confirmation as yet. The Federation of Belgian engineering works lodged a protest with the Belgian government and they bitterly complain regarding the placing of numerous trucks with German works.

We consider that a good-sized specification of structural work, bridges, roofing and box girders would come out to an average price of 1.15 to 1.35 fr. per kg. (3.85 to 4.5c. per lb.).

Steel castings sell at 1.18 to 1.25 fr. per kg. (3.93c. to 4.2c. per lb.).

For some time past large consignments of scrap material have been exported. Prices are merely nominal. The last terms quoted ranged from 12 to 18 fr. per 100 kg. ($8.75 to $13 per ton).

Zinc Market

Belgium has always been a big market. Our industry is responsible for large tonnages spread all over the world and the domestic makers want to keep their reputation. A bold cut was made quite recently and the growing stocks cannot prevent a little slump in the current prices. The limits to-day would be:

	Fr. Per 100 Kg.	Cents Per Lb.
Ingots	140	4.67
Rolled zinc	165 to 170	5.5
Corrugated sheets	180 to 183	6.0
Reclaimed zinc	92 to 98	3.07

Freight Rates from Antwerp

Freight rates on iron and steel bars, metals, etc., from Antwerp, are as follows:

To New York, Baltimore, Philadelphia, 27s. 6d.; Boston, 30s.

To Bombay, Colombo, Madras, Rangoon and Calcutta, 40s.

To South America: Christobal, Callao, 70s.; Valparaiso, 65s.; Antofagasta, Coronel, Talcahuano, 75s.; Buenos Aires and Montevideo, 65 fr.; Santos, Rio de Janeiro, 90 fr.; Pernambuco and Bahia, 40 fr.; Rio Grande, Aracaju, Paranagua, 50 fr.

To Mediterranean ports: Oran, Alger., Alexandria, 60 fr.; Smyrna, 75 fr.; Cyprus, 175 fr.; Salonica, 65 fr.

To Belfast, 47s. 6d.; Bristol, 40s.; Cardiff, 22s.; Dublin, 35s.; London, 12s. 6d.

To Lisbon, 45 fr.; Barcelona, 50 fr.; Malaga, Alicante, Valencia, 50 fr.; Gibraltar, 55 fr.; Vigo and La Coruna, 65 fr.; Cadiz y Sevilla, 60 fr.; Bilbao, Santander, 50 fr.

To Morocco: Casablanca, 100 fr.; Kenitra, 120 fr.; Saffi and Mogador, 100 fr.; Larrache and Rabat, 125 fr.; Tanger and Mazagan, 90 fr.

The above quotations are per 1000 kg. Since the armistice the shipping companies having services running from continental Europe agreed to quote freight by 1000 kg. or the metric ton of 2205 lb.

To Shanghai, 67s. 6d. or 57s. 6d. for rails.

To Japan, 65s. for bars., 55s. for rails.

To Singapore, Penang, etc., or the Straits, 62s. 6d. for bars and 52s. 6d. for rails.

The prices listed in the foregoing reflect the market position at this stage. They are to be understood in Belgian francs, although in various instances some French makers quote in French currency, but this practice is not permanent because numerous quotations on French material are made out in Belgian francs.

Mr. Schwab on Conditions in Germany

Charles M. Schwab, chairman Bethlehem Steel Corporation, returned from Europe March 17 by the White Star liner Olympic, looking and feeling well and cheerful and ready, as he declared, to go back into harness again with all his heart.

Although Mr. Schwab, accompanied by his friend, Dr. S. A. Brown, toured only France and Italy, he devoted some time getting in touch with conditions in Germany through talks with eminent German manufacturers and German economists and observers of conditions in Germany who were not Germans. "Germany will recover from the effects of the world war," he said, "much sooner, perhaps, than any other of the European countries involved in it. I noted that France and Italy were getting on their feet swiftly, but from the information I obtained I am confident that the world will have to look out for Germany as a competitor in much shorter time than is generally allotted to her.

"Germany is a conquered country and her people are aware of it, but they are like a strong man who has failed in business and sets his teeth determined to win back what he has lost by hard work and competent management. The secret of Germany's previous industrial success was the efficiency of her workers. They still have that efficiency and that training that is necessary to win the world of commerce and manufactures. Business is bad, of course, in Germany, as in all other countries, including America, but it is on the mend."

Prospect of American Exports as Viewed on Pacific Coast

SAN FRANCISCO, March 16.—The so-called paper rate of $6.50 per ton on steel shipped from United States points via the Panama Canal to the Orient, adopted in the early part of March by the local Pacific Westbound Conference, has not as yet exerted any material effect on the volume of shipments of American steel products. Belgian and German bars are underquoting the market of this country, thereby diverting business into other than American channels. This is made possible largely by unfavorable exchange rates and the unsettled condition of the Orient.

Pacific Coast shippers and steel factors are of the opinion that until the American steel industry meets the financial situation prevailing in the Orient, any further rates that ship operators may make will be of little avail in stimulating the movement of American steel to Oriental points, since the problem is not primarily one of water rates, but of a depressed foreign market in which domestic manufacturers cannot operate advantageously under present conditions.

Steel Plant to Be Built in South Africa

WASHINGTON, March 22.—The South African Iron & Steel Corporation, Ltd., Pretoria, South Africa, has definitely announced its plans to begin soon the erection of a new plant capable of producing 75,000 tons of semi-finished and finished steel annually. The plant is to be equipped with electrically driven rolling mills, furnaces and coke ovens, the latter to be fitted up with the most modern equipment for the recovery of tar, sulphate of ammonia and benzol, and probably electric furnaces. It is estimated that £2,200,000 will be spent on the new installation.

LARGE PIG IRON STOCKS

Accumulations of Steel Companies an Important Factor—More Sheet Mills Active in Mahoning Valley

YOUNGSTOWN, OHIO, March 22.—One of the leading independent steel-making interests in the Mahoning Valley has made a general advance in its quotations. Among the new prices which are being quoted are 2.40c. to 2.45c. base for plates, with 2.25c. for attractive tonnage, and 4.20c. for black sheets. A sales official of the company explains that steel products cannot be produced at the low prices which are being quoted by numerous independent companies.

A large pig iron consumer states that any tonnage of standard basic can be purhased at $23, and that a large order would be likely to bring a price of $20. He points to a recent transaction involving 20,000 tons, sold at $23 by a steel-works concern to a jobbing interest. The influence of surplus iron stocks of steel-producing interests on the pig iron market is a pronounced factor in the current situation. Makers operating coke oven departments in connection with blast furnaces are compelled to maintain a certain volume of production to prevent physical deterioration of the ovens, this fact accounting in large measure for the iron stocks which have accumulated, ranging as high as 50,000 tons with one Valley interest. The same consumer referred to above declares that one-hearth sheet bars are purchasable on the market at $35 per ton or less.

Independent steel production in the Valley this week is at the rate of 25 per cent, while the average, including Carnegie Steel Co. plants, is around 30 per cent. Seven of 25 blast furnaces are pouring; 25 of 66 open-hearths are charged; one of four Bessemer plants is active; 36 of 105 sheet mills are under power; six of the 17 tube mills, one of four plate mills and 10 of the 26 bar mills.

Two additonal blast furnaces have been blown out in the Shenango Valley, Ella furnace at West Middlesex and No. 3 stack of the Carnegie Steel Co. at Sharon. This reduces the number of active furnaces in the two Valleys to 11 out of 46, with a detached furnace being operated at Leetonia, Ohio, by the United Iron & Steel Co. The 36 active sheet mills compare with 24 the week beforee.

New Sheet Business

As the sheet mill operating rate indicates, new business is developing somewhat more freely, represented chiefly by small tonnages. Minimum prices in this district are 3c. for blue annealed, 3.85c. for black and 5c. for galvanized.

Some of the leading producers, however, would not accept business at these prices, claiming that they involve losses in production. The ruling average for black is 4c. per lb.

Increase in wire product buying continues, though the aggregate is made up of many small lots. Minimum prices are easily obtainable because of the competition among makers for business. Wire nails are weak at $3 with independent mills.

TARIFF FRAMING BEGUN

Subcommittee on Metals Appointed—Legislative Program Agreed Upon by Leaders

WASHINGTON, March 22.—Framing of the permanent tariff bill for passage at the special session of Congress called for April 11 has begun. Five subcommittees of Republicans were announced this afternoon by Chairman Fordney of the Ways and Means Committee. Other subcommittees, including one to deal with the free list are to be named. The subcommittee on metals is composed of Representatives Tilson, Connecticut, chairman; Representative Mott, New York, and Representative Timberlake, Colorado.

The bill is to be framed on the basis of hearings held at the recent sessions and it is claimed that it will strike the general line of the Payne-Aldrich act so far as protection is concerned. It will be based on American valuation, according to the present plan. House leaders also have agreed first to pass the emergency tariff with the agricultural items applicable for six instead of ten months, during which period they expect to have the permanent tariff on the statutes. Next on the House program comes the anti-dumping legislation, in charge of Mr. Fordney, to be followed by the American valuation measure for imports. Then comes international revenue legislation.

The Senate finance committee will first hold hearings on tax legislation and the Senate will take up revenue legislation as it comes from the House. Oral presentation of views as to taxation measures will be limited and witnesses for associations and business interests will be asked to file briefs.

Refractories Manufacturers' Association

At the annual meeting of the Refractories Manufacturers' Association, held last Thursday and Friday at Pennsylvania Hotel, New York, the retiring officers were re-elected. They are: President, J. D. Ramsey, Elk Fire Brick Co., St. Mary's, Pa.; vice-president, John L. Green, Laclede Christy Clay Products Co., St. Louis; treasurer, C. E. Edmunds, McLain Fire Brick Co., Pittsburgh; secretary, F. W. Donahoe. In addition to routine business, the meeting was featured by the organization of a new group to include refractories manufacturers of the Pacific Coast section. The association, as a result of this addition, now extends from coast to coast, and the membership embraces a greater tonnage production than any of the other associations of brick manufacturers. The standard definitions of clay refractories developed by the Bureau of Standards, working in conjunction with the Refractories Manufacturers' Association and subsequently adopted by the American Society for Testing Materials, were accepted, subject to future changes, at the meeting.

Annual Meeting of Waste Dealers

The scrap iron division of the National Association of Waste Material Dealers, Inc., will draw up a code of trade customs to govern transactions between dealers and consumers. This was the most important action taken by this division in connection with the annual meetings of the association at the Hotel Astor, New York, March 14, 15 and 16. C. A. Barnes, Perry, Buxton, Doane Co., Philadelphia, was appointed chairman of this committee, the other members being J. V. S. Bishop, Bishop, Friedman & Bergstrom; Joseph Michaels, Hyman-Michaels Co., Chicago; Harry Grant, Harry Grant Iron & Steel Co., Detroit, and A. M. Wood, A. M. Wood & Co., Philadelphia. Harry R. DeGroat, A. M. Wood & Co., was re-elected chairman of the scrap iron division. A motion was made to adopt rules defining what constitutes a carload shipment. The majority favored 30 gross tons as a normal carload. It was decided to solve the freight classification matter without having to appeal to the Interstate Commerce Commission. Membership in this division has increased from 50 to 110 during the year.

The eighth annual banquet of the entire association was held the evening of March 15 in the north ballroom of the Hotel Astor, there being an attendance of about 300. Americanism was the keynote, as reflected in the speeches and in the decorations of American flags which adorned the galleries. Charles S. Whitman, former Governor of New York, said that America is stronger than ever in spite of its difficulties. George W. Cartwright, State Senator of California, declared against Bolshevism.

Frank C. Overton, Castle, Gottheil & Overton, New York, dealers in papermakers' supplies, was elected president of the national association and Harry R. DeGroat first vice-president. Charles M. Haskins was re-elected secretary and treasurer.

GOOD INQUIRY FROM JAPAN

Structural Steel and Tin Plate Inquiries—German Ship Yards Active

NEW YORK, March 22.—A large proportion of the inquiries now being received by exporters are evidently for the purpose of keeping in touch with American quotations during the present period of falling prices and fluctuating exchanges. Belgium continues to book orders under American quotations. A recent example of this was an inquiry from Glasgow, Scotland, for about 1000 tons of slabs on which the American bid was not within $8 per ton of the Belgian price delivered. American terms of delivery, however, were better than those offered by the Belgian mill. Belgian billets are offered for export at about $38 per metric ton, f.o.b. Antwerp. A limited tonnage of Belgian billets has been offered a Portland, Me., rolling mill by a ship about to make a return trip from Belgium without cargo. The special price was about $28 per ton, delivered. Inquiries have been received from England for cut nails and wire in small quantities.

Exporters and warehouses in New York have recently been offered export sheets by a commission house. The offer included a lot of 40 tons of No. 30 gage galvanized sheets and 120 tons of No. 30 gage black sheets, both 36 x 72 in. packed for export, 13 sheets to a bundle, price 4.50c. per lb., New York.

The Orient continues to show some activity, although large inquiries are still mostly confined to the Japanese government. An American firm of engineers is quoting on 12 steel radio towers for Japan, totaling about 7000 tons of angles and channels, and it is reported that the steel will be bought and fabricated in Belgium and shipped from there to Japan. A recent sale of ship plates to a Japanese shipyard totaled 1800 tons, and there is an Imperial government inquiry in the market for 15,000 boxes of tin plate, bids on which will be opened early in April. India continues to buy small tonnages of nuts and bolts, but banking concerns issuing letters of credit are pursuing a policy of discouraging large business at present until stocks have been reduced.

In contrast to American and British shipbuilders, the shipyards of Germany are fairly well occupied. This is partly due to the German government requirement that private companies reimbursed for ships lost or delivered to the Allies must invest in ships built in German yards. The Deutsche Werft, Hamburg, is now building fabricated ships, and the Blohm & Voss yard is building several ships for the Hamburg-American Line. One shipbuilding company has offered to build tankers on Lloyds' or United States inspection requirements at about $135 per deadweight ton, equipped with Diesel engines.

The George A. Fuller Co. of the Orient, New York, which is erecting three modern office buildings in Tokio, Japan, is now shipping the structural steel for two of the buildings and has requested bids on the structural steel for the Nippon Yusen Kaisha Building, totaling about 3200 tons. An inquiry is also out from the purchasing agent of this company for passenger elevators for these three buildings, and within the next 30 days most of the remaining equipment, including boilers, mail chutes, ornamental iron work, etc., will probably be purchased. All materials and equipment will be bought in the United States.

PRICES IN ITALY

Business Stagnant and Market Declining—Conditions in Hungary

MILAN, ITALY, March 6.—Pig iron is in little demand and there are no immediate prospects of sales. The present quotations in lires per ton of 1000 kilos, (2205 lb.) for merchandise delivered free on cars, Genoa, are as follows:

French and Luxemburg irons....Lire	750	$30.00
Eglington, No. 1.....	1300	52.00
Middlesborough, No. 3.....	1100	44.00
English hematite, Nos. 1, 2 and 3	1290	51.60

Few sales of coal have been made in the week. In Genoa there are 19 steamers unloading and they have 96,000 tons in stock. Present quotations, free on cars, Genoa, in lires per ton of 1000 kilos are:

Cardiff .....Lire	450	$18.00
Newpelton	380	15.20
Splint	400	16.00
American steam or gas.....	375	15.00

In metals prices are inclined downward and buying is very slow. Following are prices quoted in lires per 100 kilos for merchandise delivered free, Milan:

	Week Ended			Cents Per Lb.
	Feb. 19	Feb. 26	March 5	March 5
Copper, electrolytic	850	830	825	15.0
Copper sheets	1300	1300	1300	23.6
Copper wire	1150	1150	1150	20.9
Copper tubes	1450	1450	1450	26.3
Brass sheets	1225	1200	1200	21.8
Brass wire	1200	1175	1175	21.3
Brass rods	650	650	650	11.7
Brass tubes	1350	1350	1350	24.5
Zinc pig	290	290	290	5.2
Zinc sheets	520	500	480	8.7
Tin, per kilo.....	24	23.5	23	43.6
Lead, pig	250	240	230	4.2
Lead sheets and tubes....	290	270	260	4.7
Black sheets, base, 4 mm. (5/32 in.)	215	210	210	3.8
Galvanized sheets, No. 20.	370	350	330	6.0
Tin plate	250	240	240	4.3

Most mills and shops are reducing production and laying off workmen. It is accepted that most sales are being made without profit and some at a loss. This does not seem to induce buyers to cover themselves for future needs, except as far as lead is concerned, for which some interest was noted last week.

Further reductions in prices are expected. No firms will buy on a cash basis and sales must be made at 30 or 60 days. The Germans started this system some months ago and at present even France is doing likewise. The banks have stopped all credits and money is very scarce. Most firms buy only enough to last a few days. Even large manufacturers who were in the habit of placing large contracts for coal, only purchase from 200 to 500 tons at a time.

The quotations given are for merchandise delivered free on cars or free warehouse Milan, except where otherwise mentioned. They therefor include duty.

Conditions are fairly good in Hungary. At Budapest they are now working regularly. Wages there are probably the lowest in the world to-day. A workman earns from 12 to 20 crowns per day. The main difficulty they are having is in obtaining coal and pig iron. One does not notice any great amount of poverty. The people eat white bread and meat every day, which is more than we have here in Italy, where we have two meatless days. Everyone is desirous of making business connections and of fifteen factories visited all seemed in good shape and capable of manufacturing in large quantities and in a short time and at a very low cost.

Implement Companies Reduce Prices

The International Harvester Co. has reduced prices on most of its farm machinery and implements 10 to 15 per cent. On three models of tractors, list prices have been cut $150, $200 and $350. Threshing machines have been reduced $100 and kerosene engines $10 to $35. Farm wagons, plows, and seeding machines have been reduced 15 per cent, cream separators 10 per cent, and other machines and implements 15 per cent. The reductions apply to one-third of the number of machines in the company's list, representing about 43 per cent of the gross sales volume. The J. I. Case Plow Works, Racine, Wis., has made a cut of approximately 15 per cent on all of its products, including tractors, power farming implements and tillage tools of all kinds. This is the second reduction made by the Case company since last fall. The Samson Tractor Co., a subsidiary of the General Motors Corporation, with plants at Janesville, Wis., has announced a 20 per cent reduction in tractors and a 10 per cent cut on power harrows and plows.

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ESTABLISHED 1855

THE IRON AGE

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Post-Bellum Co-operation

Following the recent statement of Secretary Hoover in regard to the closer co-operation of business men and public officials, the recommendation of Bernard M. Baruch in his final report as chairman of the United States War Industries Board furnishes additional evidence that leading men who were actively connected with the prosecution of the war are deeply impressed with the importance of continuing the mutual work which was so well done by business men and Government officials acting in harmony throughout the war period. In spite of all the errors of omission and commission which marked the prosecution of the war, including the part taken by American manufacturers, no one can read the book, "American Industry in the War," by Mr. Baruch, without a thrill of pride or without entertaining the hope expressed by him, by Mr. Hoover and many others that some of the fine spirit which prevailed during the war may be revived in helping to solve problems of the future. There is one point upon which all should be able to agree. Mr. Baruch speaks of the entire absence of partisan spirit which prevailed among the business men who were helping during the war and points out how all, regardless of politics, of ancestry, or religion, were soldiers of the common good. Surely this same spirit ought to prevail in times of peace.

Some differences of opinion existed during the war and probably always will be entertained as to the extent to which policies relating to priority, conservation, price fixing and labor questions helped retarded the prosecution of the war. Mr. Baruch's statement that priority was the greatest achievement connected with the activities of the board may be questioned, but it will be freely admitted that, although at times the priority orders seemed to cripple industries, they unquestionably resulted in decreasing waste and in encouraging substitutes which resulted in a large addition to the amount of material available for war purposes. Real service was rendered in the restriction of styles, models and fads, and ways were found of encouraging conservation without causing hardship.

How far methods of war time can be applied in the future is a matter for serious consideration. Some activities, such as those relating to price fixing, should not be thought of except under extraordinary conditions. Others, such as those relating to conservation, might be applicable in revised form to new conditions. Whether it would be wise to establish, as recommended by Mr. Baruch, some form of Government tribunal, which would have power to sanction in the public interest the intimate associations of industries which resulted in economies and increased production in 1917 and 1918, may be doubtful. At the same time it would seem quite possible to establish closer relations of Government and business without running any risk of permitting any intimate association which might result in combinations detrimental to the public interest.

Economy and Prosperity

In order to become and remain truly prosperous, the United States will have to put its operations on a sound economic basis. Such a condition will be forced in time by events, but by definite effort the time can be shortened.

There must be economy and efficiency in the employment of capital and the time of those who work. Capital already invested in fixed form cannot be recalled, and the investment must be made to yield the maximum possible in service or in goods. Capital expended in future must be expended so as to produce a maximum of return, and only when the intended return is needed. The time of those who work must be considered as a year's time—i. e., there must be the maximum possible results in a year's time, not merely good work for a few hours of the day, a smaller number than should be worked, or for less than the proper number of days in the year.

Merely for illustration, the foundation of permanent prosperity cannot be laid by bricklayers or coal miners working less than a fair proportion of the total number of hours in the year, even though their year's earnings are entirely satisfactory to themselves. Permanent prosperity cannot be expected if additional freight cars are built when the additional transportation service could be secured by getting greater results per car from those now in existence, as by better work by the men, by improvements in yards and terminals and by the employment of better systems of control.

New coal mines should not be opened if existing mines can be made to supply the demand.

The conversion of liquid into fixed capital should be encouraged solely by the route of increasing the quantity of facilities that will result from the investment of a given sum. For instance, the spending of money on dwelling house construction should be facilitated only by reducing the cost of construction, not by such methods as increasing the legal rate of interest on mortgages in States where there is a limit. Exemption of new buildings from taxation for a period of years may be expedient as a choice of evils, but it is economically dangerous.

Definite efforts to place the country in an economically sound position for prosperity throughout the future should have before them a clear perception of the relations between the quantities of capital and manpower tied up in the various operations making the total of our work as a nation, along the line indicated by remarks in this department of THE IRON AGE of Jan. 13, 1920, under the caption "The Budget of Our National Activities." Each class of work should be considered from the viewpoint of its value in point of service to the country, the proportion of the total capital it ties up and the proportion of the total manpower it engages.

For instance, there is rail transportation. That service is very important, but as the ton-mileage of freight has doubled every 12 years, this increase occurring through 1920, we have been headed to a breaking point unless the quantity of ton-miles of service per million of capital and per man-year rapidly increases. The point has been reached where about twenty billions of capital is tied up, which does not seem out of proportion on its face, but the payroll recently amounted to no less than 1,950,000 persons, representing, at five to a breadwinner, no less than 9.2 per cent of the population, which does seem out of proportion. There is too much work left for the other 90.8 per cent. The coal mining industry would show too much capital tied up and too many persons dependent upon its payrolls, if the precise figures could be presented. The building trades would show altogether too high wage charges for the quantity of service rendered in the supplying and repair of buildings, with the incidental incumbrance that the free flow of labor into this class of activity is discouraged by so-called labor leaders and business agents.

It will be necessary for real and lasting prosperity that there be the proper allocation of capital and of workers' time to the various activities, so that no activity be a drag upon the whole body and no more time and money be expended than the ultimate return will justify.

Steel Cast Centrifugally

A metallurgical development which may become important is the apparently successful production of certain steel castings in a centrifugal machine. An able discussion of the properties of these castings, which are cylinders about six feet long, appears on other pages. The author, Dr. George K. Burgess, of the Bureau of Standards, calls attention to the possibility of producing certain castings of a cylindrical shape, free from physical defects and chemical segregation, with practically no waste material such as heads and gates, the elimination of forging and boring operations, and the substitution for forging of heat treatment to produce the characteristics desired in the product.

Physical defects, such as blow holes and chemical segregation, are constant problems of the average steel foundryman, particularly when making cylindrical shapes. The matter of discard is vital, when it is considered that only 50 to 60 per cent of the steel poured into the ordinary mold appears in the finished casting. "The results suggest," says the author, "that the properties of such castings, suitably treated, may rival those of forgings of the same chemical composition"—an arresting statement and perhaps not without prophecy, since developments in heat treatment will make possible results not easy to obtain only a short time ago. Still more significant is the statement that the "properties of the [plain low carbon] castings are high for the composition and are superior in the treated condition to many results on hot rolled 0.20 to 0.25 per cent carbon steels and indeed are comparable with those of cold rolled steel of this grade."

The casting of steel centrifugally recalls a similar development in cast iron a few years ago. THE IRON AGE on Sept. 7, 1916, published the first account of a centrifugal process for making iron pipe, then in its first stages. The metal was found to be markedly different from an ordinary casting. Today this process has been so perfected that it is being used in Canada and foreign countries. The problem with steel is much more difficult. The successful casting of carbon and alloy steels, particularly nickel, is an achievement the future of which will be watched with keen interest.

Pig Iron Production

Pig iron production in the United States in 1920, according to the statistics just completed by the American Iron and Steel Institute, amounted to 36,925,987 gross tons, showing a gain of 19.0 per cent over the 1919 output, but a decline of 6.5 per cent from the record output, made in 1916.

The production of charcoal iron was 323,396 tons, leaving 36,602,591 as the output of coke and anthracite iron. Production of these furnaces as given in the monthly blast furnace reports of THE IRON AGE was 36,414,114 tons, the total being shown in the issue of Jan. 6, 1921. The difference between THE IRON AGE monthly report and the official figure is 188,477 tons, or about one-half of one per cent, a divergence too slight to be of consequence for practical purposes. It is to be noted that in this 188,477 tons the American Iron and Steel Institute includes electric ferrosilicon and various other ferroalloys of which THE IRON AGE does not collect monthly statistics.

As indicated by the discussion of "Our Pig Iron Capacity," page 398, THE IRON AGE, Feb. 10, 1921, the present iron blast furnace capacity, given normal working conditions, is about 45,000,000 tons, or nearly a million tons more than the capacity at the beginning of 1920. The average capacity in 1920 may be taken at 44,500,000 tons, of which the actual production as reported was 83 per cent. Considering all the circumstances, the furnaces did

very well. At the beginning of the year there was a shortage of coke, an aftermath of the bituminous coal strike. Later came the "outlaw" rail strikes, and at one time pig iron production was probably down to a 30,000,000-ton rate.

In view of the conditions, the actual production in 1920, at 83 per cent of the estimated capacity, indicates that the estimate is not too high. It is quite possible that with fair working conditions, full supplies of raw material and a sufficient demand, the existing blast furnaces could produce pig iron at the rate of 45,000,000 tons a year for an unlimited period, since of course the estimate allows for time out for relining and other unavoidable restrictions.

While the percentage of total pig iron production furnished in the grades used by iron foundries has been decreasing for many years, it is to be noted that there was an increase in 1920. The production of foundry iron and ferrosilicon in 1920 was 16.13 per cent of the total, against 15.85 per cent in 1919, while the production of malleable iron was 3.55 per cent, against 3.25 per cent in 1919. The proportion of Bessemer and low-phosphorus increased slightly, from 32.17 per cent in 1919 to 32.67 per cent in 1920. These gains, as well as trifling gains in ferromanganese and nondescript iron, were at the expense of basic iron, which decreased from 46.73 per cent of the total in 1919 to 45.33 per cent in 1920.

The proportion of merchant iron made slightly increased, from 28.0 per cent in 1919 to 29.1 per cent in 1920. Perhaps this change reflects the fact that the merchant furnaces, on the whole, indulged in sharper competition for coke in the open market in 1920 than did the steel interests.

The production of ferromanganese was remarkably high in 1920, being 295,447 tons, or 0.80 per cent of the pig iron total. Of this amount, 133,766 tons was made for sale and 161,681 tons for the use of the makers.

Electric Melting of Non-Ferrous Metals

At no time in the remarkable advance of American electric steel, even during the war, was there such progress as has been made in the last year in the electric non-ferrous industry. An analysis on other pages of this issue shows that on March 1, this year, there were 408 electric furnaces of all types installed or contracted for in the United States, as compared with 261 on March 1, 1920. This is an increase of 147 furnaces or about 56 per cent. The nearest approach to this in the steel industry, with Canada included, was 97 furnaces in 1917, when industrial conditions were radically different.

Besides the growth referred to, two features mark the year's progress. The development of new types of furnace has been rapid. There are now five more electric melting mediums than a year ago, or 13 against 8, while at least two more are definitely assured. Of decided interest also are the sales to foreign countries. A year ago no American furnaces were to be found in the foreign field. Now at least 18 American-built units of three different types are credited to foreign countries, with Japan a leading user; other countries include Canada, Mexico, Norway, France, Spain and England.

While European countries took the lead before the war in developing and using electric furnaces for melting and refining steel, the United States is to be credited with the initiative in applying electric power to the non-ferrous industry, with the added prospect of pointing the way to foreign users.

Government Doctors Disagree

Secretary Hoover's reference to the number of different Government agencies charged with looking after bears of different colors—the black, the brown, the grizzly and the polar bear being protegees of as many separate bureaus—has found a striking parallel in the reports of different Government agencies on the subject of unemployment or lack thereof. On March 16 the United States Employment Service reported upon the number of employees in fourteen lines of industry; on March 17 the Bureau of Labor Statistics of the Department of Labor reported upon the number of employees in fourteen lines of industry—not the same fourteen, though there was considerable overlapping.

Employees in iron and steel plants were shown, by the U. S. E. S. report, to have decreased in number from Jan. 31 to Feb. 28 by 7.3 per cent. Employees in iron and steel plants were shown, by the B. of L. S. report, to have increased in number in February as compared with January by 0.8 per cent. Which is to be believed? And why is the expensive effort duplicated, of compiling such statistics?

The reports of the U. S. E. S. are based on about 462,400 employees, in an unstated number of plants; those of the B. of L. S., on about 141,000 employees, in 114 plants. Therein may lie the reason for the difference in the answer. That may explain why one agency reports an increase in employment, the other an increase in unemployment. But whatever the reason, the contradiction in statement should not exist. The facilities for the collection of these basic figures should be so merged that the public may have the benefit of a real answer and one to which no reasonable doubt can attach.

CORRESPONDENCE

The Railroad Tangle

To the Editor:—A keen sense of fair play induces me to call attention to the befogged atmosphere which the railroads are creating in presenting their "wage reduction campaign" to the public. It reminds one of the fable of the fox, which, quenching his thirst at the stream and wishing to pick a quarrel with the lamb drinking a few yards downstream, admonished the latter for disturbing the mud and spoiling his drink.

The general impression created by the campaign is that rates of pay are so exorbitant, that, coupled with the reduced volume of traffic which is being handled, the financial situation of the railroads is being seriously imperiled. That as a consequence, rates of pay will have to be reduced in an effort to keep the ship afloat.

As applied to a general commercial proposition this plea would be entirely reasonable, but the railroad situation to-day cannot be regarded in the same category, for the simple reason that it is safeguarded by

an arrangement unique in its scope and intended to meet just such a contingency which has arisen.

Briefly, the final arrangement made by the late Administration in September, 1920, to place the roads on a safe basis was as follows:

1. The roads to be guaranteed a return of 6 per cent for a period of two years. The 6 per cent to be computed upon the valuation (not capitalization) of the roads, which figure was assessed at $18,900,000,000.
2. Increased freight rates were sanctioned with a view to meeting this guaranteed return, and based also to cover
3. increased labor rates, which were an integral part of the entire arrangement.

Even though we, as taxpayers, may not approve this scheme, yet we have to admit that under this agreement the railroads and their employees are actually a privileged class, due to the fact that three factors are definitely pegged, viz.:

Labor rates,

Freight rates,

Net income.

On the other hand, where a pronounced reduction in the volume of freight justifies a reduction in the working forces, this would be quite in harmony with the intention of the transportation act.

I am not aware that the United States Government has repudiated its guarantee to meet the 6 per cent net return on the year's work.

I am not aware that the railroads contemplate reducing the present high freight rates.

I am, however, aware that according to the view of the roads, the only way to save their necks is to reduce the fixed labor rates.

My contention is that this attitude is absolutely uncalled for, as both employer and employee are, in this particular line of industry, protected under the wing of the Government of United States, and relief from the present financial stress is to be sought from the coffers of the Treasury as guaranteed under the transportation act. WILLIAM WATSON.

Bayonne, N. J., March 20.

To Eliminate Union Arrogance

To the Editor: As a superintendent of a large forge shop and as having come to this position years ago from faithful service in the ranks, beginning from the very bottom, I am convinced that a great deal of discontent on the part of workmen culminating in arrogant labor union policies is caused by the present day tendency of cutting out the foreman as a leader of his men.

To come directly to the point, I believe that interfering with department foremen by petty assistants, such as time study clerks, systematizers, factory committees, and others working as assistants to the men higher up and subject to orders from no one else, has a demoralizing influence, creating indifference and dissatisfaction among the men. It drives them into labor unions, or if already in, it puts them in a frame of mind from which aggressive policies quite naturally ensue. I have never held a union card; I never wanted it. I was interested in my work, and the shop and its influences all tended to hold my interest. The foreman was no figurehead; he was a real live proposition, settling disputes, sharing good luck and bad, and we felt that we were living. Our jobs were genuinely personal affairs, the personal touch was direct, immediate, not theoretical and wrapped up with all sorts of incomprehensible cross currents of authority.

To my mind the average workman is inclined to take an interest in his foreman and his job. When he has a "kick" to make the foreman is the natural one to whom to turn to straighten the matter out. When, however, in seeking redress for some real or fancied injustice he is referred to the man higher up, he takes an indifferent stand, is hard to satisfy and becomes an easy prey to disgruntled dissatisfaction and union propaganda. Discipline, efficiency and system of the genuine sort I heartily indorse, but it is too common to overdo these things to the serious disadvantage of workmen and employers alike.

My plea is for putting more faith in foremen, trusting them to the limit, giving them authority to adjust and act when it comes to dealing with the disputes between workmen and the company. The character of the foreman, or rather his personal characteristics, count a great deal, of course. Honest, patient, competent men, men who command the respect of workmen, are not to be found on every hand. The same energy, however, directed to the matter as is put to the overcoming of financial or mechanical difficulties of the business will finally get and hold foremen to whom full authority may with utmost safety be intrusted.

JOHN H. LLOYD,

Avon, Pa.

Time to Make Improvements

To the Editor: During the war period the rolling mills of this country operated continuously at capacity. After the war output gradually declined until at present many mills are shut down altogether, while a few are still running part time. This condition is, of course, generally recognized as unsatisfactory, although, in another respect, the shut down presents an opportunity to make long delayed repairs and especially imperative improvements that will have direct bearing on economic relations when the mills are again running full. There is naturally going to be some lively competition when that takes place and the management that can anticipate essentials and equip suitably to meet new conditions will be amply compensated for any improvement made now.

It is generally conceded that labor and steel prices will not fall to pre-war level, leaving labor cost slightly higher than heretofore. This new relation, therefore, must be balanced carefully and without any serious conflict with labor conditions. To disturb relations the least, adjustment can be accomplished by improving mill layout and machinery conditions so that 20 to 25 per cent greater output can be had with the same amount of men employed in the same labor hours. In other words, use facility and better machinery to take care of the new relations. A. W. HEINLE.

Pittsburgh, March 9.

Wants and Needs

To the Editor: Your editorial giving distinction between wants and needs is well taken. The wants of the people are limitless, and actual needs are very modest.

It is not true that people buy enough after a depression to make up for lost time. If I do not buy an automobile this year, or for four years, I will not buy two automobiles then to make up. If I have my clothes patched up this year, on account of dull times, I will not buy two suits next year to make up. And so in many ways, people can get along on less.

Our ancestors undoubtedly got along for centuries with comparatively little. E. L. ARNOTT.

Ever-Ready-Can Co.,
Greenfield, Ohio.

The Iron Age and Its Readers

A notable innovation in business paper advertising has featured THE IRON AGE for several weeks. It is a method of indexing the advertising pages to make them more convenient for the subscribers to use.

For some time advertisements have been grouped according to products. The page facing the inside of the front cover has contained the classification. Now each grouping is given a section number and each advertising page carries in parentheses alongside the page number the number of the section to which the advertisements printed thereon belong. Many complimentary comments have been made on the value of the arrangement, one to the effect that the plan has "certainly placed THE IRON AGE in a class by itself in point of accessibility of buying information." By a series of tests it has been found that the advertising section for any product can now be located in approximately ten seconds.

American Railway Engineering Association

Rail Committee Perplexed Because of Mills' Attitude Toward Association's 1920 Specifications—Track Spike Specification Changed

RAIL manufacturers have offered no constructive criticism of the 1920 rail specifications of the American Railway Engineering Association and they have given but little assistance to the rail committee of the latter organization in the work of improving specifications. Yet they refuse to roll rails of any weight under a contract requiring full compliance with all features of the 1920 specifications and will roll according to modified specifications only if large extras are paid. As a result the association is perplexed as to what action to take. Should it adopt two specifications, one to be the best possible without running into extra price; the other to be the 1920 specification, possibly revised, but requiring an extra price; or should it have one specification carrying no extra, and name specific refinements in order of importance so that roads requiring higher grade of rail will have the benefit of the association's judgment on the most valuable of such refinements?

This was the substance of the report of the rail committee read before the American Railway Engineering Association in its twenty-second annual convention held at Chicago on March 15, 16 and 17. In the absence of the chairman of the committee, G. J. Ray, chief engineer Delaware, Lackawanna & Western Railroad, the report was presented by J. M. R. Fairbairn of the Canadian Pacific Railway. It is, in part, as follows:

A $9 Extra Regarded Too High

The manufacturers, as represented by their rail committee, have stated that they will roll rail up to 110 lb. per yard under the 1920 specifications slightly modified to eliminate a few of the so-called objectionable paragraphs on manufacture or mill practice. This modified specification will take an extra price estimated at approximately $13 per ton for a base price of $57, or something in excess of $9 on a base price of $47. The manufacturers' committee has further stated that they will not meet the 1920 specifications at all for rail 111 lb. per yard and over. The big extra demanded by the manufacturers has practically killed the new specification. Naturally, no railroad management will pay so large an extra for a standard specification until it has been proved beyond a doubt that rail manufactured under such specifications is sufficiently superior to warrant the extra price.

The manufacturers have, and I believe with just cause, criticized the rail committee's method of tabulating rail failures. The committee now has under consideration a revised method of reporting rail failures, due consideration to be given to the tonnage carried.

I am convinced that the manufacturers believe that the consumers as a whole are not sufficiently interested in purchasing a better wearing or safer rail to pay the extra cost of production. Their belief is founded on good ground, as many of the roads claim that the 1915 specifications or the manufacturers' specifications with slight modifications produce quite satisfactory rail. Therefore, why should they have to pay more money for some other specification?

On the other hand, many of the roads with excessively heavy traffic are not at all satisfied with the 1915 specifications. Excessive wear and undue breakage have made it advisable to look for a better wearing and safer rail, even to the extent of paying a material premium for such rail.

All concerned agree that part of the rail as rolled under the 1915 specifications is entirely satisfactory, both from the standpoint of wear and breakage. Many roads have had trouble from breakage, the worst type of failure being the transverse fissure, and often part of the rails are soft and wear badly or flow rapidly under traffic.

In the 1920 report of the committee on safety of railroad operation to the National Association of Railway and Utility Commissioners you will find the following statement concerning rails: "The published annual statistics on rail failures signify that the margin in strength is in many cases exhausted by the conditions which now prevail in the track. It is obvious that increased durability and safety in rails must be attained in one or both of two ways, either the physical properties of the steel must be raised or the working stresses lowered."

Better Physical Qualities Regarded Essential

I am not an advocate of heavy wheel loads, but it is obvious that we cannot, consistent with economic or satisfactory operation, reduce the present average of the freight car axle load. The old light cars are gradually being replaced with heavier ones so that the average wheel load is constantly on the increase. Since the flow of metal either on the surface of the rail or at some distance below the surface is primarily caused by the heavier car wheel loads it is evident that the wear of the rail will be faster and the flow greater unless some improvement is made in the physical properties of the steel. The working stresses in the rail can be lowered by the use of heavier rail, but increasing the rail section will not reduce the tendency of the metal to abrade or flow under wheel loads.

A few years ago the manufacturers were strongly contending that excessive breakage and poor results with rail were due to the failure on the part of the roads to use a sufficiently heavy rail to take care of the heavy wheel loads and other requirements. The quite general use of much heavier rail in recent years has proved beyond a doubt that the use of heavier rail has not eliminated the difficulties. In fact, the heavier rail has in many cases proved to be fully as troublesome from a breakage standpoint as the lighter rail. In connection with this, it is interesting to note that since some of the roads have started to use a heavier section than 110 lbs. per yard, the manufacturers now claim that these heavy sections cannot be rolled under as rigid a specification as the lighter sections. They are not willing to guarantee as good elongation for the heavy sections under the drop hammer.

If all the rails rolled under the 1915 specifications had equally as good physical qualities as the best 50 per cent of the rails, there would be little cause for complaint and there would be little or no reason for a statement like that quoted above.

Opposition to Two Standards

The rail committee is at present somewhat confused as to what to do under the prevailing conditions. Those reasonably well satisfied with the quality of rails now being received are opposed to changing the specifications if by so doing the price of rails will be increased. They are also opposed to two standard specifications, one for a higher quality of rail to require an extra price. Naturally they do not wish to be placed in the position of purchasing an inferior brand of rail.

With the present attitude of the rail manufacturers there is little that can be done by the rail committee to improve the 1915 specifications without creating extra expense on the part of the purchaser.

It is a fact that many of the mills are rolling rails under modified specifications and the rail manufacturers freely admit that they are willing to roll rails for individual roads under specifications containing many of the objectionable features of the 1920 specifications. Some such specifications take a slight extra; in other cases no extra is charged. The rail committee has sought a reason from the manufacturers for their willingness to roll rail without extra charge under private specifications when they are not willing to have the special features of the private specifications included in the "A. R. E. A." specifications. In answer the manufacturers give what appears to be a more or less reasonable explanation.

Where the manufacturer and the individual road agree on a special specification, consideration is given to all features of the specification and the method of inspection together with the judgment and fairness of the inspector, or those responsible for the inspection. Where both the physical and chemical properties of the finished rail are limited as in the A. R. E. A. 1920 specifications, a strict compliance with the specifications as to chemistry might be the cause of discarding more or less perfectly good rail, but where the railroad officials are inclined to be fair and reasonable, some of the manufacturers are willing to try out the specifications, although such specifications may vary

materially from the standard. They are not willing to take chances with inspectors at large and claim that the general use of such a specification as the A. R. E. A. 1920 would cost the manufacturers a material amount of money, and in their opinion such refinement is not needed with the greater portion of the tonnage used throughout the country.

Specifying Method of Manufacture and Requirements

There is undoubtedly some merit to the manufacturer's contention that the purchaser should not specify the method of manufacture and also place a limit on both the chemical and physical requirements of the finished rail. On the other hand, the consumer is anxious to have sufficient control over the mill practice and to place such limits on the physical and chemical properties of the finished rail as to insure the elimination of both the dangerous and poor wearing rail.

It has been my experience that some rail manufacturers are more willing than others to assist in working out a new specification. I have personally been responsible for the acceptance of a material amount of rail on a strictly physical test without regard to chemistry, except as to the limit of phosphorus. I am frank to say that the manufacturers did their utmost to produce a high quality rail and the outcome was that very satisfactory results were secured.

Speaking on behalf of the rail committee, the chairman invites full discussion either on the floor of the convention or in writing in order that the rail committee shall have the benefit of your views on the subject.

The rail committee will endeavor to reach a conclusion during the coming year. First: Should the association adopt two specifications, one to be the best possible without running into extra price; the other to be the 1920 specification, possibly revised, but requiring an extra price. Second: Should we have one specification without extra cost over the manufacturer's base price, the association to be given a list of specific refinements in the order of their importance (considering the probable cost) so that roads requiring a higher grade of rail will have the benefit of the association's judgment on the most valuable of such refinements.

At the conclusion of the reading of the report, the association adopted new rail record forms revised and renumbered to divide them into groups relating to inspection and shipment, rail failures, and rail wear. M. H. Wickhorst discussed the relation of shattered steel in fissured rails to the mill end of the rail and concluded that a fissure is a development of some of the small cracks originally in the rail. The shattered condition does not extend to the surface, either at the top or the side, but remains about a half inch away. The shattering, in his opinion, develops in cooling and seems to be shrinkage checks.

Unsafe Rails from Unsound Ingots

C. W. Gennet, Jr., R. W. Hunt & Co., Chicago, stated that unsafe rails can generally be traced to unsound ingots. He said in part:

Perhaps the most curious fact apparent at the mills is their loathness to adopt any special means aiming toward the casting of sounder ingots. It is practically agreed that the segregated and physically unsound steel occurring in the top part of the ingots is the direct cause of virtually half of the troubles occurring with rails in service, for split, crushed, flowed and mashed heads are mostly confined to "A" or top rails from ingots. The number of "A" rails constitute, roughly, 15 per cent of all that are rolled and, while they all bear a mark of suspicion, still their price is the same as for the less doubtful rails.

Several mills have recently widened the distance between the supports in the cold straightening presses and as much as 60 in., instead of 42 in., is now being used. Needless to say, the results are favorable and it is to be hoped that the practice will be adopted at all the mills and the punishment of the rails in the damaging process of straightening thus reduced.

A continued source of difficulty at most mills is the inability to make every heat of open hearth steel analyze within the limits of the chemical composition specified for the particular order being worked. Frequently whole heats in the form of ingots or blooms have to be temporarily set aside to be later reheated and rolled on orders which their composition fits. Such cases invariably give rise to an increased number of flawed rails and the practice is manifestly unsatisfactory. Carbon is one of the chief causes of this trouble, and it would be extremely desirable to agree on a common standard to cover the carbon content of all rail steel.

It is difficult to say what specifications for rails are the most commonly used. Definite figures would probably show that the manufacturers' standard had been used on the largest tonnage, and following them would come the A. R. E. A. of 1915, often with modifications making in virtually that of the A. S. T. M. and, finally, several others of the individual railroads. Practically all of these specifications contain the clause governing ductility, which requires that the drop test pieces show at least 5 per cent elongation in 2-in. or 6 per cent in 1 in.

The question of interior defects showing at the drop test is important. The rejections at one mill, due to interior defects, were approximately 10 times those at another. Such a diversity of results, of course, indicates a diversity of practice, and naturally raises again not only the question of making sound ingots, but also the desirability of treating each ingot as a unit and testing it accordingly, as was repeatedly done in war times with shell steel and is easily accomplished at the Canadian mills on rails for that country.

I venture the statement that good steel cast into sound ingots, of proper composition, followed by careful treatment in the soaking pits and rolling mills, may be expected to result in rails of such quality as to withstand safely, when laid on a roadbed of good ballast and ties, the heavy wheel loads of traffic for years to come.

New Cut Track Spike Specification Adopted

On the recommendation of the committee on track, the association adopted a new cut track spike specification. The design of the ⅝-in. spike is the same as before except that the width of the toe end has been changed to ⅝-in. instead of ½-in. and the curve under the head has been changed for greater strength and better contact of the jaw of a claw bar. A new bolt specification was also adopted. Bolts, other than heat treated, must be of mild carbon steel with a tensile strength of not less than 50,000 lb. per sq. in. and an elongation of not less than 15 per cent in 8 in. Heat treated or high tensile bolts must be of carbon or alloy steel and conform to the following minimum requirements:

Tensile strength	100,000 lb.
Yield point	70,000 lb.
Elongation in 2 in.	15 per cent
Reduction of area	40 per cent

Large Attendance

The registration at the closing session of the convention showed a total of 650 members and 165 guests, or a combined total of 815, as compared with an attendance of 759 last year.

The officers elected for the coming year include: President, L. A. Downs, vice-president and general manager Central of Georgia Railroad; vice-president, E. H. Lee, vice-president and general manager Chicago & Western Indiana Railroad; treasurer, G. H. Bremner, district engineer Bureau of Valuation, Interstate Commerce Commission, Chicago; secretary, E. H. Fritch, Chicago.

Iron, Steel and Heavy Hardware Convention at Montreal

Montreal has been chosen as the city for the twelfth annual convention of the American Iron, Steel and Heavy Hardware Association, Broadway and Thirty-fourth Street, New York, on June 7, 8 and 9, headquarters to be maintained at the Windsor Hotel. A feature of the convention will be the meeting with the Canadian trade, distributers all over the Dominion having been invited. Because of the favorable exchange rate, American money will be worth from 10 to 15 per cent more than if spent in this country. Trips are being arranged to places of historic and scenic interest. Intentions of attending are being written to A. H. Chamberlain, secretary-treasurer of the association at the New York office.

At the plant of the Youngstown Sheet & Tube Co., Youngstown, Ohio, a coil of No. 5 rod coming from the rod mill weighing about 320 lb. and containing approximately 3000 ft., if drawn into No. 18 gauge, will finish about 53,000 ft. or 10 miles of wire. The wire mill capacity of the company is about 400 net tons per 24-hr., and when this tonnage is finished into No. 10 gage, which is about the average gage of total wire drawn, represents about 3100 miles of wire. In order to produce this amount of finished material, it is necessary to draw approximately 5200 miles of wire, because of repeating the process on some sizes.

Iron and Steel Markets

STRUCTURAL STEEL BUYING

Average of Steel Works Operations Little Changed

More Blast Furnaces Idle—Steel Corporation Cuts Pig Iron Output

Better buying of steel for construction and the reinstating of a few more fractions of the voluminous cancellations by automobile builders have been favorable features of the week. A good many buyers have been heard from with small orders, without any increase in the average of steel plant activities. Little is said of the spring demand of which there were predictions when the year came in, and there is more settling down to the prospect of a drifting market.

Price developments are not uniform and cannot be called significant. Pig iron and scrap are lower, particularly the latter. In finished lines the weak spots still are wire products, sheets and bolts and nuts. As heretofore, plates, shapes and bars have been available at 2c., Pittsburgh, but there are also some instances of the withdrawal of that price.

The sharp advance in costs due to restricted operations has more than offset with some steel producers the help of recent wage reductions.

The Steel Corporation has been taking new business at the rate of about 15,000 tons a day, or nearly one-third of capacity. The flow of specifications in some lines has slowed down under independent offerings at lower prices, but the effect has not been marked.

More blast furnaces are going out, and the Steel Corporation's curtailment of pig iron output has been rather rapid. Its steel production has not declined in proportion, in view of the stocks of pig iron and scrap it has on hand.

On all sides the effort is to reduce to the minimum the output of pig iron at present high costs. Out of 166 merchant furnaces only 27 are now operating, including 2 in Alabama and 1 in Tennessee, and several furnaces in New York, Pennsylvania and Ohio will probably blow out soon.

The week has been the best in many months in structural steel, with a total upward of 17,000 tons, which compares with 25,600 tons for all of February. This last was the lowest monthly total in nine years except for January and February, 1919, which averaged 22,000 tons. The week's business is swelled by 7400 tons for a mail terminal building in Chicago. Fully 35,000 tons is active in the East. For the 7000-ton Federal bank structure in Cleveland 700 tons of sheet piling has been closed. For a municipal contract in Detroit 3000 tons for reinforcing work has been bought and 5600 tons is pending there for sewers. Public work in Detroit will require in all perhaps 25,000 tons, including 15,000 tons for tracks and accessories for the proposed municipal car lines.

That steel prices are not fixing construction costs appears in a difference of $28 per net ton in the low and high bids on an important fabricating contract just let, whereas the low current quotation of 2c. on structural steel is only $9 per ton less than the 2.45c. of the Steel Corporation. As low as $84 has been done on an industrial building for fabrication and erection.

The keen interest buyers commonly show in the latest cut, when prices are declining, is absent to-day, indicating that prices are not the pivot on which consumption is turning.

Agricultural implement works in particular promise to be poor buyers of steel in 1921. Implement warehouses are well stocked and farmer buying power is low.

A Middle Western producer recently took a contract for 8000 tons of line pipe for the Sinclair Oil Co. at a considerable concession in price. The National Tube Co.'s operations have been reduced at both the Wheeling and Lorain, Ohio, plants.

The Carnegie Steel Co.'s schedule for this week calls for 45 per cent operation in its steel works departments and it now has 25 active blast furnaces out of 59. In the Chicago district the Steel Corporation has had a 47 per cent production of steel ingots for the past two weeks.

Long continued dullness in the market for steel-making irons in the Pittsburgh district was relieved last week by inquiries for three round lots of basic, but the increased interest developed weakness, due to some steel companies being willing to sell from their accumulations, and sales were made at $23, Valley, or $2 below the recent quotation. The Bessemer pig iron market at Pittsburgh is also weaker to the extent of $2. The price of basic in eastern Pennsylvania has again declined, a sale of 1500 tons having been made at $25, delivered, to a Delaware River steel company. In foundry irons concessions are still being made, but at some points the market seems better able to resist the pressure for lower prices and there is some increase in melt.

Belgian billets have been offered as low as $28, delivered at domestic Atlantic ports, concessions on steel and freights arising out of efforts to bring back cargoes in ships bound for Europe.

Pittsburgh

PITTSBURGH, March 22.

Some increase in the demand is observed in the steel market, but the actual orders are numerous, rather than large, and reflect entirely the urgent requirements of buyers. No appreciable increase in plant activities has resulted from the enlarged demands, which, for the most part, are being supplied from stock. One fabricating company in this district has secured awards aggregating 10,700 tons, and while it was necessary for it to go pretty low in its prices, the award is encouraging as showing that business exists at a price. Two Valley independents and one in Cleveland, which had out quotations of 2c., Pittsburgh, against a number of inquiries, have withdrawn them since a week ago and owing to the fact that costs have risen so sharply as a result of the restricted operations, a number of independents are inclined to see actual inquiries before naming prices.

Conditions in the automobile industry as regards both the demand and plant operation undoubtedly are better now than they have been before in several

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 22, 1921	Mar. 15, 1921	Feb. 22, 1921	Mar. 23, 1920
No. 2X, Philadelphia‡	$27.26	$27.26	$30.09	$46.05
No. 2, Valley furnace†	*25.00*	26.00	27.00	42.00
No. 2 Southern, Cin'ti†	29.50	29.50	32.00	43.60
No. 2, Birmingham, Ala.†	25.00	25.00	27.50	40.00
No. 2 foundry, Chicago*	25.00	25.00	28.00	43.00
Basic, del'd, eastern Pa.	*25.00*	26.26	28.40	44.80
Basic, Valley furnace	*23.00*	25.00	25.00	42.00
Bessemer, Pittsburgh	*26.96*	28.96	28.96	43.40
Malleable, Chicago*	25.50	25.50	28.50	43.00
Malleable, Valley	*25.00*	26.00	27.00	43.00
Gray forge, Pittsburgh	*25.96*	26.96	27.96	42.40
L. S. charcoal, Chicago	38.50	38.50	38.50	57.50
Ferromanganese, Atl. port	90.00	90.00	90.00	200.00

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	38.50	38.50	38.50	60.00
O.-h. billets, Pittsburgh	38.50	38.50	38.50	60.00
O.-h. sheet bars, P'gh	*38.50*	40.00	42.00	70.00
Forging billets, base, P'gh.	43.50	43.50	43.50	80.00
O.-h. billets, Phila.	44.24	44.24	49.24	64.10
Wire rods, Pittsburgh	52.00	52.00	52.00	70.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.45	2.45	2.70	4.25
Iron bars, Chicago	2.60	2.60	2.63	3.75
Steel bars, Pittsburgh	2.00	2.00	2.00	3.75
Steel bars, New York	2.38	2.38	2.38	4.02
Tank plates, Pittsburgh	2.00	2.00	2.15	3.75
Tank plates, New York	2.38	2.38	2.53	4.02
Beams, etc., Pittsburgh	2.10	2.10	2.15	3.25
Beams, etc., New York	2.48	2.48	2.53	3.52
Skelp, grooved steel, P'gh.	2.35	2.35	2.45	2.75
Skelp, sheared steel, P'gh.	2.50	2.50	2.65	3.00
Steel hoops, Pittsburgh	2.80	2.80	2.80	4.00

Sheets, Nails and Wire. Per Lb. to Large Buyers:	Mar. 22, 1921 Cents	Mar. 15, 1921 Cents	Feb. 22, 1921 Cents	Mar. 23, 1920 Cents
Sheets, black, No. 28, P'gh.	3.85	3.85	4.10	5.50
Sheets, galv., No. 28, P'gh.	5.00	5.00	5.35	7.00
Sheets, blue an'l'd, 9 & 10.	3.00	3.00	3.20	4.50
Wire nails, Pittsburgh	3.00	3.00	3.10	4.00
Plain wire, P'gh	3.00	3.00	3.00	3.50
Barbed wire, galv., P'gh.	3.85	3.85	3.85	4.45
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00

Old Material, Per Gross Ton:				
Carwheels, Chicago	*$14.50*	$15.00	$19.00	$37.00
Carwheels, Philadelphia	18.00	18.00	23.00	42.50
Heavy steel scrap, P'gh	14.00	14.00	16.00	27.50
Heavy steel scrap, Phila.	13.00	13.00	14.50	25.00
Heavy steel scrap, Ch'go	*12.00*	12.50	14.50	24.50
No. 1 cast, Pittsburgh	21.00	21.00	22.00	34.00
No. 1 cast, Philadelphia	19.00	19.00	23.00	38.00
No. 1 cast, Ch'go (net ton)	*14.00*	14.50	17.50	37.50
No. 1 RR. wrot, Phila.	17.00	17.00	19.00	35.00
No. 1 RR. wrot, Ch'go (net)	*11.00*	11.50	13.00	27.50

Coke, Connellsville, Pet Net Ton at Oven:				
Furnace coke, prompt	*$4.25*	$4.50	$4.50	$6.00
Furnace coke, future	5.75	5.75	5.75	6.00
Foundry coke, prompt	5.50	5.50	5.50	7.00
Foundry coke, future	6.00	6.00	6.50	7.00

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	12.12½	12.12½	13.25	18.87½
Electrolytic copper, N. Y.	11.87½	11.87½	12.75	18.50
Zinc, St. Louis	*4.70*	4.75	4.95	8.50
Zinc, New York	*5.20*	5.25	5.35	8.85
Lead, St. Louis	4.00	4.00	4.20	8.75
Lead, New York	4.00	4.00	4.40	9.00
Tin, New York	**28.50**	28.00	32.50	60.75
Antimony (Asiatic), N. Y.	5.25	5.25	5.20	11.50

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

months. To this improvement can be ascribed the slight quickening in the demand for sheets and other automobile steel, and in the capacity engaged in the production of these kinds of material.

Despite the fewer number of manufacturers who are willing to go the limit on prices to secure orders, it is impossible to chronicle any definite or material advance in prices. Attractive tonnages in the major products carrying a price of 2c., it may be said, still would get attention from some makers. Although 4c. is minimum on black sheets, with several independents 3.85c. still is possible. The average of prices based on actual sales, however, is probably a little higher than it has been, for the reason that such business as has been coming out has been in such small amounts that only makers badly in need of business are tempted to quote the low prices which recently have been current.

In the way of operations, it may be said that there has been a slight increase in Valley sheet making capacity and that the recent rate of operation of tin plate mills has been well sustained. Bar, shape and plate mills, however, are not at all well engaged and there has been a definite falling away in the occupation of pipe making capacity. This week the National Tube Co. is included among those which are running on a lighter scale. This company suspended operations at its Riverside Works, Benwood, W. Va., last Saturday night, the shut down affecting two blast furnaces, five skelp mills, five butt-weld furnaces and two lap-weld furnaces. One blast furnace of the Lorain, Ohio, works of this company has been blown out and its total operations now are placed at 75 per cent of capacity as compared with practically full operation a week ago. The Carnegie Steel Co. schedule for this week calls for 45 per cent operation in its steel works departments, while as of to-day it had 25 of its 59 blast furnaces making iron. Since a week ago one Duquesne, one Farrell and one New Castle furnaces went on the idle list. The Clairton plant of this company started up last week, but the Farrell, Pa., works went down last Saturday and a suspension of the Mingo, Ohio, and New Castle, Pa., works is expected shortly.

While merchant producers of pig iron continue to report sales at $25 for basic grade, it is known that at least one lot of 1000 tons of this grade from one of the steel plants in the Valley district has been sold at $23, while the latter price also has been named against an inquiry from an Allegheny Valley sheet maker who seeks 1000 tons. Several of the steel companies have rather sizable stocks of basic on their yards and while they are not making public quotations, it is commonly believed that some of them would take $23 to secure an order. The scrap iron market presents no new feature, but a reduced wage scale of some of the Connellsville operators is reflected in a slightly weaker market in coke.

Pig Iron.—The appearance of three definite inquiries for round lots of the steel-making grades has developed a competitive market between merchant and steel plant offerings. A merchant producer with furnaces in the Valley reports a sale of 1000 tons for immediate delivery at $25, but against this is one of a similar quantity to a Valley steel maker from one of the Valley steel plants at a price of $23, furnace, while the Allegheny Steel Co., which has an inquiry out for 1000 tons each of basic and Bessemer, is said to have been quoted $23 and $25 respectively, on these grades. The West Penn Steel Co. again is in the market for 500 tons of basic iron. The actual market on basic appears to be nearer $23 than $25, for merchant producers who are holding at $25 for this grade generally are losing in the case of inquiries upon which they are quoting. Practically nothing has been done in the past week in foundry iron and the price has become nominal. It is apparent, however, that tonnages could be placed at $25, Valley furnace, although most makers

are holding at $26. The Perry furnace, Erie, Pa., will go into operation soon for a brief period. It seems that some of the melters served from this furnace refuse to take iron from any other stack and the management has been forced to start up after a suspension since the latter part of last year.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$23.00 to $25.00
Bessemer	25.00 to 27.00
Gray forge	24.00 to 25.00
No. 2 foundry	25.00to 26.00
No. 3 foundry	24.50 to 25.50
Malleable	25.00 to 26.00

Ferroalloys.—We note a few small sales of domestic 76 to 80 per cent ferromanganese at $90 delivered and since this is new, as distinct from resale material the market hardly is quotable at a higher figure. English makers continue to quote $100 c.i.f. Atlantic seaboard, but this price is merely nominal and is out of the question with the domestic product so much lower. Business remains dull to the point of stagnation in spiegeleisen in this district, but reports from other centers are that at least one of the large producers is taking business at $33.50 furnace, and a higher price could not be obtained here. We revise quotations accordingly. No business worthy of note is being done in 50 per cent ferrosilicon and trading positively is at a standstill in Bessemer ferrosilicon and silveries. Jackson, Ohio, producers have made no change in their schedules, but it is beyond question that they would have to make substantial concessions to secure orders.

We quote 76 to 80 per cent ferromanganese at $90 delivered on domestic and $100 c.i.f. Atlantic seaboard, the quotation of English producers. We quote average 20 per cent spiegeleisen at $32.50 furnace, 50 per cent ferrosilicon $93 to $95 furnace, freight allowed, for domestic and $90 to $95 delivered for foreign material. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, $54.50; 10 per cent, $58; 11 per cent, $61.30; 12 per cent, $64.60. Silvery iron, 6 per cent, $40; 7 per cent, $41.50; 8 per cent, $43.50; 9 per cent, $45.50; 10 per cent, $48; 11 per cent, $51.30; 12 per cent, $54.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Sales are so few and small as to make impossible reliable quotations. Although some increase has come in the past week in the active capacity of independent sheet makers, due to somewhat enlarged operations by the automobile manufacturers, it is evident that the companies which have started up are well provided with sheet bars, as new demands have amounted to little. Small tonnages have been sold at a range of $38.50 to $40. Nonintegrated manufacturers express the belief that they will be able to buy sheet bars when they need them at $35, Pittsburgh or Youngstown, but no standard bars have sold that low as yet, although it is reported that a Chicago district maker recently named a price of $35 Pittsburgh, on a Western inquiry. The market in rerolling billets is even less clearly defined than that in sheet bars because the demand is so limited. Prices of forging billets are entirely conjectural.

We quote 4 x 4-in. soft Bessemer and open hearth billets at $38.50; 2 x 2-in. billets, $40.50; Bessemer and open hearth sheet bars, $40 to $42; slabs, $41; forging billets, ordinary carbons, $43.50, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Reports are heard of sales at $47, but these are stated to refer to resale tonnages of odd lots A really sizable order probably would bring out lower prices, but at the moment independent makers are quoting $52 Pittsburgh, while the American Steel & Wire Co. holds to $57 for the base size of soft rods. Prices are entirely untested because so few demands are presented. Prices are given on page 807.

Steel Rails.—The situation in standard rails shows no change other than that the failure of the railroads to make even partial payments against shipments already made seems to be discouraging active execution of the bookings which the several makers took some time ago. Coal companies are making moderate purchases of light rails, but the total demand is not sufficient to give all makers a share and prices remain in buyers' favor.

We quote 25 to 45-lb. sections, rolled from new steel, 2.35c. to 2.75c.; rolled from old rails, 2.25c.; standard rails, $45, mill, for Bessemer, and $47 for open-hearth sections.

Plates.—The market has been featured by the withdrawal of 2c. quotations by two Valley and one Cleveland independent, but this development does not necessarily mean that this price cannot be done. An inquiry is noted for 2500 tons of plates for tanks, for an oil company, some of the tonnage to go to Buffalo and the remainder to Oklahoma, and it is commonly expected that this business will be placed at not above 2c., Pittsburgh. Railroad equipment manufacturers are showing no interest in the market and increased orders to the structural interests have not been productive of new plate business, probably because so many of the fabricating interests entered the period of depression with heavy stocks.

We quote sheared plates of tank quality ¼ in. and heavier at 2c. to 2.65c., Pittsburgh.

Structural Material.—The McClintic-Marshall Co. was the successful bidder for the 7500 tons of steel required for the Union Station in Chicago, the plain material for which is to be supplied by the Bethlehem Steel Co. and also for the 3000 tons for the new sheet mill of the International Nickel Co., Huntington, W. Va., the plain material to be furnished by the Midvale Steel & Ordnance Co. The same interest also has taken 200 tons for a bridge for the St. Louis Terminal Railroad Co., St. Louis, while the Fort Pitt Bridge Co. has taken 750 tons for street viaducts in connection with the Union Station in Chicago. The Jones & Laughlin Steel Co. report an award of 100 tons for a building for the Tropical Oil Co., Colombia, South America. Altogether it has been the best week in a long time in the matter of awards, although on the larger projects it is reported that a price of $84 to $85 per ton erected had to be made to secure the business. Figuring an erection charge of about $15 per ton, the price of the fabricated steel works back to about 3.50c. per lb. Even at a price of 2c., Pittsburgh, on the plain material, this price would hardly let the fabricators out with a profit. Plain material prices are given on page 808.

Wire Products.—Small orders calling for quick delivery are fairly numerous, but generally are being supplied from stock and there has been no material gain in plant activity, although one independent recently put on three additional open-hearth furnaces and an additional rod mill. Practically all of the current business is going to the independents, who are quoting bright nails and plain wire at $3, cement coated nails at $2.60, and are said to be taking business in galvanized fence wire as low as $3.45.

We quote wire nails at $3.00 to $3.25 base per keg, Pittsburgh, and bright basic and Bessemer wire at $3 to $3.25 base per 100 lb., Pittsburgh.

Nuts, Bolts and Rivets.—Demand still is slow in all three products and while plants in this district are averaging about three to four days a week, the bulk of the production is for stock. Prices entirely are in favor of buyers. Prices and discounts are given on page 808.

Spikes.—Business in both large and small spikes still is exceedingly slack. The range of prices on large spikes is a very wide one, running from 3.65c., the quotation of the Illinois Steel Co., down to about 3c. Pittsburgh, which makers here have encountered in quoting against inquiries. The equivalent of 3.02c., Pittsburgh, is reported to have been made in the east recently. (Prices are given on page 807.)

Cold-Finished Steel Bars.—Business shows no perceptible increase despite the larger operations of a number of the automobile manufacturers, and the fact that parts makers have lately had a good many releases against suspended orders. The latter evidently have not reduced their inventories to a point where they are disposed to take on new tonnages of steel. At least two of the large makers of cold-finished steel bars are still quoting the old base of 3.60c. and that also is the price of the American Steel & Wire Co., but other makers are quoting 3.25c. and would go to 3c. base if this would insure an order. Too little is going on to give basis to any price at present.

Hot-rolled and Cold-rolled Strips.—Releases against suspended orders by some of the automobile companies are reflected in somewhat heavier operating schedules of a number of makers, but with new business still of

extremely limited proportions, capacity is not being at all heavily taxed. Official quotations of a number of producers are 3.30c. base on hot-rolled and 6.25c. base on cold-rolled strips, but as far as any recent business is concerned 2.80c. to 3.05c. on the former and 5.65c. to 6c. base on the latter are more representative quotations and the better appraisals of the present price possibilities.

Iron and Steel Bars.—The fact that the demand for merchant steel bars is extremely small is evident from the fact that the lowest operating rate of any of the finishing mills of the Carnegie Steel Co. is in its bar mills, while the independents here and in the Valley have only a small fraction of their capacity running on bars. The bulk of the current orders are for small tonnages for quick delivery. Such lots generally command some advance over what the independent would be willing to accept on sizable orders. Iron bars are in very limited demand and while refined bars nominally are quoted at 3c. on carload lots, a concession of $5 per ton from this figure probably could be obtained.

We quote steel bars rolled from billets at 1.95c. to 2.35c.; reinforcing bars, rolled from billets, 2c. to 2.35c. base; refined iron bars, 2.75c. to 3c., in carloads, f.o.b. mill, Pittsburgh.

Hoops and Bands.—Practically no demand exists and releases against suspended orders are few. Prices range from 2.80c. to 3.05c., although there are intimations that some makers are using a bar base of 2c. and quoting the usual differential of 70c. above that figure.

Iron and Steel Pipe.—A Middle Western producer recently secured about 8000 tons of line pipe for the Sinclair Oil Co. The order includes 8-, 4-, 3- and 2-in. pipe, and is the largest of this character which has been placed in some time. It is reported, though not confirmed, that the successful bidder made substantial price concessions. Generally the demand for both oil country and merchant pipe is of extremely moderate proportions, although the leading interest reports new bookings to have been better this month than they were last month. Building operations throughout the country are larger, but jobbers have fairly large stocks and are not disposed to replace sales as promptly as usual in the expectation that prices will drop and a desire to avoid being caught with high-costing supplies, though some of the independents are giving guarantees against a decline in prices. Discounts are given on page 808.

Sheets.—More extensive operation by the automobile manufacturers has resulted in a number of releases against suspended orders, and this finds reflection in somewhat heavier operations by a number of independent sheet mills. About 32 per cent of the independent mills in the Valley district are operating this week, but there has been no increase in the activities of the American Sheet & Tin Plate Co., due to the fact that it had a considerable tonnage of sheets in stock and releases merely mean the pickling and further finishing of these tonnages to be ready for shipment. Although some of the independents no longer are disposed to quote less than 4c. on black sheets, the 3.85c. quotation has not entirely disappeared. A quotation recently has been made at 4.75c. base on galvanized sheets, but this is said to refer only to the heavier gages and the maker naming that price would not accept business in the base size at that figure. Prices are given on page 808.

Tin Plate.—While the demand is far below normal, enough business is coming out to keep up plant operations to the recent average, which for the independents was about 40 per cent and for the American Sheet & Tin Plate Co. somewhat in excess of 50 per cent. The 26 mills of the Weirton Steel Co., Weirton, W. Va., which have been running four days a week, starting on Tuesday, next week will start up on Sunday night, while 12 of the 24 mills of the Wheeling Steel & Iron Co., Yorkville, Ohio, will start up next Monday morning. The latter plant has been down since last November. Production plate still is quoted at $7 per base box, but stock plate is selling down as low as $6 and it is said that standard plate is included in sales of the latter kind.

Old Material.—Interest in the market on the part of melters still is of a passive sort and the only real demand that exists is from dealers who have yards on which to throw their purchases. Prices largely are being made by such demands and the tendency is downward for the reason that in view of the rather poor prospect of any material increase in steel plant or foundry operations in the near future, dealers feel they must buy cheaply if they are to get out whole. It must be said, however, that the decline is pretty gradual because old material is not coming out at all freely at current prices. The market for rerolling rails is very limited at present due to the fact that the hard bar makers have such sharp competition from the steel companies rolling these bars from new steel. A recent offering of rerolling rails was taken by a steel company to be cut up for open-hearth melting because regular users could not take them. A Pittsburgh dealer recently bought 6000 tons of shells at $15.10 f.o.b. Neville Island. These shells were rough forgings and will cost the buyer $16 laid down on his yard. We note a sale of a moderate sized tonnage of heavy melting steel to a Valley steel maker at $15 delivered.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$14.00 to $15.00
No. 1 cupola cast	21.00 to 21.50
Rerolling rails, Newark and Cambridge, O.; Cumberland, Md.; Huntington, W. Va.; Franklin, Pa., and Pittsburgh	16.00 to 16.50
Compressed sheet steel	12.00 to 12.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	10.50 to 11.00
Railroad knuckles and couplers	15.00 to 16.00
Railroad coil and leaf springs	15.00 to 16.00
Railroad grate bars	14.00 to 14.50
Low phosphorus melting stock, bloom and billet ends, heavy plates, ¼-in. and heavier	21.00 to 22.00
Railroad malleable	15.00 to 16.00
Iron car axles	34.00 to 35.00
Locomotive axles, steel	30.00 to 31.00
Steel car axles	19.00 to 20.00
Cast iron wheels	18.00 to 19.00
Rolled steel wheels	15.00 to 16.00
Machine shop turnings	9.50 to 9.75
Sheet bar crop ends at origin	14.00 to 15.00
Heavy steel axle turnings	12.00 to 12.50
Short shoveling turnings	10.50 to 11.00
Heavy breakable cast	16.00 to 16.50
Stove plate	15.00 to 16.00
Cast iron borings	11.00 to 11.50
No. 1 railroad wrought	15.00 to 16.00

Coke.—Continued decline in the production of beehive oven coke does not seem to be strengthening the market to any noticeable extent, probably because demands are dwindling quite as steadily as the production. If anything, the market is slightly weaker than it has been in that a price of $4.25 per net ton oven has been made against an inquiry from a merchant furnace interest which is planning to blow in a furnace this week against some orders which the buyers insist shall be from this particular furnace. While the recent wage cut by W. J. Rainey, Inc., has not been followed by many of the Connellsville operators, most of whom are disposed to follow the lead of the H. C. Frick Coke Co., it is evident that there has been some response to the Rainey reduction and this is reflected in the lower prices which recently have been made in the face of a declining production. The spot market on oven run furnace coke now is quotable at $4.25 to $4.50 per net ton oven, with tonnages loaded on cars and which must be moved, available at $3.75 to $4.00. The contract furnace market is nominal, as there is no new business and shipments against contracts made around the end of last year are practically all suspended. The latter generally were on a five to one ratio on Valley basic pig iron, but carried minimums of $5.75 and this price nominally holds in the absence of shipments or any attempt as yet in the direction of adjustments. A fair demand still exists for spot foundry coke and on choice brands the market is quotable at $5.50 to $6 per net ton oven. As low as $5 is reported on foundry grades, but coke at this price probably is not strictly standard. There is no change in the coal market, which still is quotable at $2 to $2.25 per net ton, f.o.b.

mines, for run of mine steam coal, and from $2.50 to $2.75 for run of mine gas or by-product coal. Contracting so far has not amounted to much for the reason that buyers expect lower prices, while producers are in doubt that they will be able to effect any reduction in costs since this would be possible only through an abrogation of the contract with the United Mine Workers. Consequently they are holding rather firmly for $3 for steam coal and 25c. to 50c. per ton more for gas and by-product grades.

British Iron and Steel Market

Situation Much Worse—More Works Down—Prices Heavily Cut

(*By Cable*)

LONDON, ENGLAND, March 21.

Further Cleveland furnaces have been blown out. Some consumers appear still to be awaiting price reductions; consequently there is little business being placed. Export markets are hampered by adverse exchanges. Cleveland producers still maintain that costs will not allow further substantial cuts. Prices are consequently unchanged.

Two more hematite furnaces have been stopped. Home consumers are not buying and there is little indication of improvement in the export situation. East Coast mixed numbers prices are unaltered.

Foreign ore is lifeless. Bilbao Rubio is nominally 37½s. ($7.35) ex-ship Tees. Coke is unchanged. Additional West Coast steel works have closed and others are working on short time or partially closed. There is some revival in export demand, especially for the Far East. Makers of structural shapes and plates are competing keenly for such business. Official home quotations are unaltered.

The Welsh tin plate position is growing worse. It is estimated that the present loss of output amounts to 2,000,000 base boxes. Stocks at works are diminishing and makers are no longer keen sellers, asking up to 15s. ($2.94) for quarter wasters.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.92 per £1 as follows:

Midland coke	£2	14½				$10.68	
Cleveland basic	6	15	to £7	0*		26.46 to	$27.44
Cleveland No. 1 foundry	7	15	to 8	0*		30.38 to	31.36
Cleveland No. 3 foundry	7	10	to 7	15*		29.40 to	30.38
Cleveland No. 4 foundry	7	9	to 7	14*		29.20 to	30.18
Cleveland No. 4 forge	7	7½	to 7	12½		28.91 to	29.89
East Coast mixed	9	0				35.28	
East Coast hematite	12	0				47.04	
West Coast hematite	12	0				47.04	
Ferromanganese	22	0				86.24	
Ship plates	18	0	to 21	0		70.56 to	82.32
Boiler plates	27	0	to 28	0		105.84 to	109.76
Tees	17	0	to 20	10		66.64 to	80.36
Channels	16	5	to 19	15		63.70 to	77.42
Beams	16	0	to 19	0		62.72 to	74.48
Round bars, ¾ to 3 in.	16	10	to 20	0		64.68 to	78.40
Rails, 60 lb. and up	18	0	to 21	0		70.56 to	82.32
Billets	13	10	to 14	10		52.92 to	56.84
Sheet and tin plate bars, Welsh	14	0	to 14	10		54.88 to	56.84
Galvanized sheets, 24 g.	24	0	to 26	0		94.08 to	101.92
Black sheets	22	10	to 23	10		88.20 to	92.12
Tin plate base box	1	5	to 1	10		4.90 to	5.88
Steel hoops	20	0				78.40	

*Export price.

Shipping Rails to Japan and China

BIRMINGHAM, ALA., March 21.—The Tennessee Coal, Iron & Railroad Co. is making a shipment of 8000 tons of steel rails for China and Japan via Mobile. Two ships are there to load, one of them being the Fairfield City, latest product of the Chickasaw Shipbuilding & Car Co. The rails are sent down the Warrior River by the Warrior barge line at a saving of 20 per cent in the freight rate over rail transportation. The Tennessee company also patronizes the river barge line by having its manganese ore from Brazil brought up that way to the furnaces at Ensley.

Chicago

CHICAGO, March 22.

The plants of the leading steel interests continue to operate at 47 per cent of ingot capacity, but independent operations are slightly improved. The Inland Steel Co. is now on a 40 per cent basis, with two blast furnaces, seven open hearths, 12 sheet mills, the 24-in. structural mill and the plate mill operating. The Chicago Heights rail carbon steel bar mill of the same company started yesterday. The operations of the Mark Mfg. Co. have also increased, all of its pipe mills now being active. Other producers are running at about the same rate as heretofore.

The award of about 8000 tons of fabricated steel for Chicago Union Station improvements is the outstanding feature of the market this week. The prompt letting of this work after the submission of bids is regarded as a favorable omen by fabricators and others identified with the building industry. Much pending work has been held up awaiting prices which would attract investors and bankers, and the action of the Union Station Co. is regarded as a criterion of what others may do. Already a considerable amount of small work has been undertaken, particularly schools, churches, motion picture theaters, which are of reinforced construction or partly reinforced and partly fabricated.

The downward trend of the various iron and steel commodities has slackened, and except for scrap, no product has dropped definitely to a new level. This may be attributed partly perhaps to the small volume of current inquiries and also to a growing conviction on the part of producers that concessions have failed to develop a buying movement. The market still has its weak spots, notably wire products, sheets and bolts and nuts. On wire and sheets, new low prices have been named in recent transactions.

Pig Iron.—A Wisconsin melter who recently bought two 2000-ton lots of Northern foundry at $26, delivered, is in the market for from 1000 to 1500 tons of low manganese foundry iron. This is the only large inquiry before the trade. Outside of a sale of 100 tons of Northern No. 2 foundry at $26, local furnace, most current transactions have been confined to carload lots. So far as can be ascertained, Northern prices are on about the same basis as a week ago. The American Radiator Co. has bought 300 tons of Southern foundry, 2.25 to 2.75 per cent silicon, at $25 base, Birmingham, for its Detroit plant. A few carloads were sold recently in the Chicago district at the same price. Copper free low phosphorus has again given ground, now being available at $37.50, Valley furnace, while 125 tons of slightly off grade material was recently sold in this market at $35, Valley. Several carload lots of 8 per cent silvery have been bought locally at $40, delivered. Foundry operation in this district is still far below normal, but here and there signs of improvement are to be noted. The increase in the operations of automobile plants has resulted in the release of castings against old contracts, thus improving the financial condition of Michigan and Indiana foundries. No new castings work is being let by car makers, but if operations continue to increase independent melters will again be favored. The increase in building activity which gets its impetus chiefly from non-industrial projects such as theaters, school houses and churches, has already been reflected in better operations among certain gray iron foundries which are making castings for school desks and theater seats.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 70c. per ton:

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago		$38.50
Northern coke, No. 1 sil. 2.25 to 2.75	$26.25 to	28.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	25.00 to	27.00
Northern high phos	25.00 to	27.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25		34.67
Southern coke, No. 2 foundry, sil. 2.25 to 2.75		32.92
Southern foundry, sil. 1.75 to 2.25		31.67
Malleable, not over 2.25 sil.	25.50 to	27.50
Basic	25.00 to	27.00
Low phos. Eastern furnace (copper free)		37.50
Silvery, sil. 8 per cent		40.00

Plates.—Pending railroad car business has not yet resulted in orders for the mills. The Mt. Vernon Car Mfg. Co. and the American Car & Foundry Co. are apparently in no hurry to place the steel for the cars to be built for the Louisville & Nashville, and the Santa Fe has asked car builders to submit revised figures on 1000 composite gondola cars. Some plate tonnage continues to come from miscellaneous sources, but in the aggregate it is small. Independent quotations remain at about 2c., Pittsburgh, for tank plates.

The mill quotation is 2c. to 2.65c., Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.78c. for plates out of stock.

Structural Material.—The McClintic-Marshall Co. has been awarded 7400 tons of structural steel for the Mail Terminal building, to be built in connection with the Chicago Union station. A considerable portion of the material consists of Bethlehem sections, which will be rolled by the Bethlehem Steel Co. The Chicago Union Station Co. also awarded 760 tons for Canal and Van Buren street viaducts to the Fort Pitt Bridge Works. Competition for these contracts was keen and in the case of the Mail Terminal building was exceptionally close, the three lowest bids being between $75 and $80 a ton delivered. Among new inquiries in the market is the Commodore Perry hotel and theater, Akron, Ohio, which calls for about 500 tons of fabricated steel besides a considerable tonnage of reinforcing bars. John Eberson, Chicago, is the architect.

Other recent lettings include:

Seaplane hangar, San Diego, Cal., 414 tons, to Phoenix Bridge Co.

Missouri Pacific Railroad, a 100-ft. turntable, 108 tons, to the American Bridge Co.

Terminal Railroad Association of St. Louis, Goodfellow Avenue bridge, 100 tons to McClintic-Marshall Co.

The mill quotation is 2.10c. to 2.45c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.58c. for materials out of warehouse.

Ferroalloys.—An offer by a melter of $35, delivered, for spiegeleisen remained unsatisfied, indicating that resale material has largely disappeared. From furnace the alloy is available at not less than $40, delivered. Fifty per cent ferrosilicon is slightly weaker and can be obtained from some sellers at $90, delivered.

We quote 75 to 80 per cent ferromanganese, $90 to $95 delivered; 50 per cent ferrosilicon, $90 to $95 delivered; spiegeleisen, 18 to 22 per cent, $40 to $42 delivered.

Sheets.—The increasing operations of the automobile industry have released small tonnages to the mills for rolling, but as yet the business developing from that source has been light because of the large stocks which many car makers must dispose of. A number of inquiries for very light sheets, ranging from 200 to 500 tons, have been received from the Far East. Generally speaking, however, current business is light and the market is weak. Independent makers are still making an effort to establish a price basis of 3c., 4c. and 5c., base Pittsburgh, respectively on blue annealed, black and galvanized, but concessions under these figures are more numerous. On blue annealed 2.85c., base Pittsburgh, has been done and on black 3.85c., while galvanized is reported to have been sold at as low as 4.40c.

Mill quotations are 4c. to 4.35c. for No. 28 black; 3c. to 3.55c. for No. 10 blue annealed, and 5c. to 5.70c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 4.68c.; No. 28 black, 5.75c.; No. 28 galvanized, 7.10c.

Warehouse Prices.—Local jobbers have reduced cold-rolled strip steel and round-edge cold-rolled flat wire 25c. per 100 lb., the new price for the former being $8.15 and for the latter $8.50.

Wire Products.—Inquiry is somewhat better and a survey of the market in this territory indicates that some buyers, particularly jobbers, are running out of stocks and will be forced to replenish them. A most encouraging sign is the evidence of increased interest on the part of jobbers in the Northwest, a section of the country which has suffered business reaction most severely. At least two important independents are now quoting $2.75 on bright hard-drawn wire, $3 on wire nails and annealed wire and $3.45 on galvanized wire. Of the various wire products, barbed wire is most sought after. For mill prices, see finished iron and steel, f.o.b., Pittsburgh, page 807.

Rails and Track Supplies.—Railroads continue to specify freely against rail and track fastening contracts, but new inquiries are few.

Standard Bessemer rails, $45; open-hearth rails, $47; light rails, 2.75c. f.o.b. makers' mills.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.60c., Pittsburgh. Steel tie plates, 3c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3c., f.o.b. makers' mills.

Bars.—The demand for bars from industrial companies is still light, although some tonnage is being released by the automobile manufacturers, as they slowly increase their operations. In Detroit and vicinity, the average output of car makers is now between 25 and 50 per cent, and the Ford Motor Co. is producing in excess of 3000 cars a day. In some cases, these plants will not need new steel for some time because of large unused stocks on hand. Current buying of bars is principally for construction purposes. Some tonnage for highway reinforcing is being placed and an increasing number of reinforced concrete structures are being started. This building activity is largely outside of Chicago, and, in the main, consists of the construction of schools, churches, theaters and other non-industrial projects. The largest inquiry in the market is the Detroit filter plant, which involves 2200 tons of reinforcing bars. Independent quotations on soft steel bars are rather firmly established at a 2c., Pittsburgh, minimum, although sales at 1.90c. and 1.95c. are reported. The demand for bar iron is still too small to test mill quotations and rolling capacity is largely idle. The hard steel bar mill of the Inland Steel Co. at Chicago Heights started yesterday and the plant of the Calumet Steel Co., which resumed work a week ago, is still active. Buying of rail carbon steel bars is light, however, and is limited mainly to fence post manufacturers. Although there have been no official changes in the warehouse quotation on deformed steel bars, practically all sales are at concessions and average prices actually charged range from 2.73c. to 3c., Chicago.

Mill prices are: Mild steel bars, 2c. to 2.35c., Pittsburgh taking a freight of 38c. per 100 lb.; common bar iron, 2.60c. to 2.68c., Chicago; rail carbon, 2.25c. mill.

Jobbers quote 3.48c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.25c. for rounds and 5.75c. for flats, squares and hexagons an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. on orders up to 1000 lb. Jobbers quote hard and medium deformed steel bars at 2.73c. to 3c. base.

Cast-Iron Pipe.—This commodity is still moderately in demand, with much pending business held back awaiting market developments. Hamilton, Ohio, will take bids on 200 tons, March 23. Columbus, Ohio, has awarded 350 tons to the United States Cast Iron Pipe & Foundry Co. To the same maker has been sublet 250 tons for Wauconda. The Lynchburg Foundry Co. is low bidder on 300 tons for Springfield, Ill., and the American Cast Iron Pipe Co. submitted the lowest bid on 250 tons for Fort Wayne, Ind.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $69.10; 6-in. and above, $64.10; class A and gas pipe, $4 extra.

Bolts and Nuts.—There has been little or no increase in buying and prices continue weak, although no official reductions have been reported.

Jobbers quote structural rivets, 5.08c.; boiler rivets, 5.18c.; machine bolts up to ⅝ x 4 in., 50 per cent off; larger sizes 45 off; carriage bolts up to ⅝ x 6 in., 40 off; larger sizes, 40 off; hot pressed nuts, square and hexagon tapped, $1.60 off; blank nuts, $1.85 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off. Quantity extras are unchanged.

Railroad Rolling Stock.—The Santa Fe is inquiring for 300 low side gondola cars in addition to the 1000 gondola cars for which it has been in the market for several weeks.

Old Material.—Aside from a little buying of cast scrap by foundries, the market has been practically inert and prices have again slumped. Railroad lists

include the Burlington, 3500 tons, and the Chicago Great Western, 400 tons.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$19.00 to $19.50
Relaying rails	32.50 to 37.50
Car wheels	14.50 to 15.00
Steel rails, rerolling	13.00 to 13.50
Steel rails, less than 3 ft	13.50 to 14.00
Heavy melting steel	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.50 to 12.00
Low phos. heavy melting steel	14.50 to 15.00
Drop forge flashings	8.00 to 8.50
Hydraulic compressed sheet	10.00 to 10.50
Axle turnings	9.00 to 9.50
Per Net Ton	
Iron angles and splice bars	15.50 to 16.00
Steel angle bars	11.50 to 12.00
Iron arch bars and transoms	16.00 to 16.50
Iron car axles	25.50 to 26.00
Steel car axles	14.00 to 14.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Cut forge	11.00 to 11.50
Pipes and flues	8.00 to 8.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
Steel knuckles and couplers	11.50 to 12.00
Coil springs	13.00 to 13.50
No. 1 cast	14.00 to 14.50
Low phos. punchings	11.50 to 12.00
Locomotive tires, smooth	10.50 to 11.00
Machine shop turnings	5.50 to 6.00
Cast borings	7.00 to 7.50
Stove plate	14.00 to 14.50
Grate bars	11.00 to 11.50
Brake shoes	11.00 to 11.50
Railroad malleable	13.75 to 14.25
Agricultural malleable	13.75 to 14.25
Country mixed	8.50 to 9.00

New York

NEW YORK, March 22.

Pig Iron.—So far as any change in the market can be detected it is for the better, but there is no marked change. Sales of one firm last week amounted to about 1500 tons and this week there are a number of inquiries amounting to perhaps 1000 tons pending. Owing to the short reduction in production of pig iron, some buyers are wondering whether there is any likelihood of a shortage in event of the market showing a decided improvement, but there is no great anxiety on account of this possible condition. In eastern Pennsylvania some sales are being made at $27, furnace, for No. 2 plain, but $26 and $26.50 are frequently quoted. Two Susquehanna furnaces are expected to be blown out very soon, leaving only one merchant stack in blast in the Buffalo district. Many contracts for pig iron have been adjusted and deliveries made at least in part, and the undelivered tonnage of contracts which were made last year is not very large.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$29.52 to $30.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	28.52 to 29.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	27.52 to 28.52
Buffalo, sil. 1.75 to 2.25	32.46 to 33.46
No. 2 Virginia, sil. 1.75 to 2.25	33.16 to 34.16

Ferroalloys.—There is no activity in either the ferromanganese or spiegeleisen market and, in the absence of any test of values, quotations are nominal. Asking prices for the British alloy continue at $100, seaboard, with the American product quoted at $95 to $100, delivered, with the probability that $90 could be done. Inquiry is confined to a carload here and there which is also true of spiegeleisen. Quotations for the latter are nominal at $35, furnace, and this could be and is shaded on desirable business. There is no demand for high-grade manganese ore, which is quoted nominal at 30c. to 35c. per unit, seaboard. There is no demand for 50 per cent ferrosilicon, which is also nominal at $92 to $95 per ton, delivered.

Finished Iron and Steel.—No improvement in local steel trade is reported, though inquiry is slightly better. Plates and bars are easily to be had at 2c., Pittsburgh, while structural shapes are slightly higher, 2.10c. to 2.25c., depending on the specification. There is very little business in any of these products, though the demand for small lots of shapes is slightly improved. Lowest priced business noted includes a sale of 200 tons of steel bars at 1.80c., Pittsburgh, and about 350 tons of reinforcing concrete bars at 1.80c., mill, corresponding to substantially the same price. Axle forgings along with other commodities are obtainable at $12 to $13 a ton below the Corporation's price. An Eastern steel company will start up its 14-in. bar mill this week on orders from automobile companies, which were canceled some months ago and now reinstated. The Coatesville plant of the Midvale Steel & Ordnance Co. will start up next Monday on part operation, largely to give employment to some of the company's workmen. Among other Eastern steel plants operating conditions are about as they have been for some weeks. One plant will start up a plate mill this week, but has only about a week's rollings. In the structural field prospects are good, but jobs are slow in closing. It is not so much the price of steel that is holding back such projects, but other costs, especially labor. Jobs have been let around $90 per ton, fabricated and erected. The McClintic-Marshall Co. is reported to have been awarded the new plant of the International Nickel Co. in West Virginia, 2500 tons, and the Cambria Steel Co. will furnish the plain material. Four oil tanks for the Beacon Oil Co., 700 tons, have been awarded to an unnamed fabricator. Bids have gone in on 450 tons for an insane asylum at Morris Plains, N. J. The George A. Fuller Co. has the general contract for work in Japan for the Nippon Yusen Kaisha, involving 3200 tons.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.38c. to 2.73c.; plates, 2.38c. to 3.03c.; shapes, 2.48c. to 2.83c.; bar iron, flats, wider than 6 in., 2.98c., with half extras; light rounds, squares and flats, 3.48c.; with full extras, and other sizes, 2.48c., with half extras.

High Speed Steel.—Slightly better inquiry is reported but sales remain about the same as for some time. Prices on 18 per cent tungsten high speed steel range from $1 to $1.10 per lb. with tool makers receiving their usual 10 per cent discount from some companies in both cases.

Cast-Iron Pipe.—Business is encouraging and present prices are holding fairly firm. The city of Boston is scheduled to open bids on 2000 tons of 6 to 36-in. pipe on March 24. Several inquiries are coming in from private gas and water companies. The city of Syracuse has not yet decided to buy following the submitting of bids to it. We quote on small lots, f.o.b. New York, as follows: 6-in. and larger, $63.30; 4-in., $73.30; 3-in, $83.30, with $4 additional for Class A and gas pipe.

Old Material.—Prices have again dropped, ranging from 50 cents to $3 a ton. There has been a little activity in heavy melting steel, cast scrap and turnings. A Delaware steel company has bought a little steel, a New York broker offering dealers $12.75 a ton delivered to this plant. The chief purchases are those by dealers who are willing to lay material down in their yards to await a rise.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$8.00 to $8.50
Rerolling rails	10.00 to 11.00
Relaying rails, nominal	40.00 to 42.50
Steel car axles	12.00 to 13.00
Iron car axles	27.00 to 28.00
No. 1 railroad wrought	11.50 to 12.50
Wrought iron track	8.00 to 9.00
Forge fire	7.00 to 7.50
No. 1 yard wrought, long	11.00 to 12.00
Light iron	4.00 to 5.00
Cast borings (clean)	5.00 to 6.00
Machine-shop turnings	6.00 to 6.50
Mixed borings and turnings	5.00 to 6.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.00 to 10.00
Stove plate	13.00 to 14.00
Locomotive grate bars	10.00 to 11.00
Malleable cast (railroad)	12.00 to 13.00
Old car wheels	13.00 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.00 to 18.00
No. 1 heavy cast, not cupola size	13.00 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 14.00

Warehouse Business.—A slight increase in the number of inquiries, although not in size, is reported by most warehouses, but business generally continues "flat." There are some complaints of mills cutting into the warehouse field by filling orders for a ton or more of material at mill prices and in some instances less than one-ton orders. Warehouse prices show but little change with the exception of the Carnegie Steel Co.'s Waverly warehouse, which has reduced its truck-

ing charge in the metropolitan district from 15c. to 10c. per 100 lb. Charges for delivery to points in New Jersey remain at 10c. This places practically all warehouses in New York and Brooklyn including the leading interest and the foremost independent on the same level of price for bars, beams, channels, angles and tees and plates. With almost no exceptions warehouses are now quoting the following prices or lower on sheets: No. 10-gage blue annealed, 4.78c. per lb.; No. 28-gage black, 5.83c. per lb., and No. 28-gage galvanized, 7.23c. per lb. Offers of lots of canceled export sheets are still being made. A New York house has offered a lot of 40 tons of No. 30-gage galvanized and 120 tons of No. 30-gage black sheets at 4.50c. per lb. for both. The situation in iron and steel pipe is unchanged. We quote prices on page 828.

Cleveland

CLEVELAND, March 22.

Iron Ore.—The Lake Superior Ore Association is preparing a supplementary complaint to be filed with the Interstate Commerce Commission in the proceedings instituted some time ago, asking that all ore rates from the mines to upper lake ports be reduced. The supplemental complaint is the outcome of the recent advance in the tariffs on ore made by the Michigan and Wisconsin railroads. The new tariffs on ore carried by those railroads became effective Feb. 25 after the Ore Association had asked that the new tariffs be suspended until the shippers could be given a hearing, but their request was denied. The supplemental complaint will have the effect of uniting the general ore rate advance case and that covering the objections to the recent advance in old range rates that has abolished the long existing differential in rail rates between the old range and Mesabi ores. Shipments from docks to the furnaces continue very light and show a tendency to further decrease.

We quote delivered lower lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesabi Bessemer, $7.20; Mesabi non-Bessemer, $6 55.

Pig Iron.—The demand for foundry iron for prompt shipment shows a slight improvement and some of the furnaces report a better volume of shipping orders this month as compared with January and February. In Cleveland there is no change in the situation, nor does there appear to be any noticeable improvement in the Michigan territory, but some of the foundries in northern Ohio and in some other sections are apparently getting somewhat busier. Local interests report sales during the week aggregating approximately 1900 tons. These include three or four 200 ton lots and other lots down to carloads. While most of the sales were for prompt shipment, some of the larger lots were for delivery over periods of three or four months. With the exception of one small lot of malleable iron, all the sales were in foundry iron. A local producer has reduced its price $1 a ton to $26 for No. 2 foundry for outside shipment to meet the usual Valley price, but is still asking $27 for local delivery. Another lake furnace has reduced its price 50c. a ton to $26, although it made a few sales during the week at $26.50. With these reductions furnaces in this territory are virtually on a $26 basis for foundry iron except for local iron for Cleveland delivery. With the present wide spread between delivered prices on Northern and Southern foundry iron in this territory, there is virtually no demand for the latter. An occasional order is being placed for a car lot of low phosphorus iron, and this grade in resale iron has not entirely disappeared.

We quote delivered Cleveland as follows, based on the new freight rates, these being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$26.96
Northern No. 2 fdy., sil. 1.75 to 2.25	27 56
Southern fdy., sil. 2.25 to 2.75	$32.92 to 33.92
Ohio silvery, sil. 8 per cent	46 86
Standard low phos., Valley furnace	41.50 to 42.00

Finished Iron and Steel.—There are increasing evidences of the improvement in production in the automobile industry in a better volume of small orders from manufacturers of automobiles and auto parts. Some orders in lots up to 100 tons are being placed by this industry for forging bars, rim steel and other finished products. In some cases the business is in the form of new orders and in others the substitution of new specifications for old orders that had been suspended. The demands of the automobile trade have also brought out some inquiries for forging billets on which quotations of $40 are reported. Municipal work in Detroit is creating a demand for considerable steel, the total requirements aggregating approximately 25,000 tons. The Mt. Vernon Bridge Co. has taken the Jefferson Avenue lift bridge in that city, requiring 1300 tons of structural material. A contract for extensions to the Detroit waterworks system requiring 3000 tons of reinforcing bars has been placed, and the Collis Creek sewer, which is pending, will require 5600 tons of reinforcing bars. The municipal street car lines in Detroit will require 11,200 tons of standard rails, 40,000 steel ties and some light rails, making the total steel requirements approximately 15,000 tons. Specifications are promised this week for the Federal Reserve Bank Building, Cleveland, requiring 7000 tons of structural material. For this building a Buffalo mill has taken 700 tons of sheet steel piling. The Stevens Iron Works Co., Cleveland, has taken 250 tons for a Cleveland school building. An interesting feature of the price situation is the tendency on the part of some of the independent mills to stiffen on plate prices, which have suffered from the price decline more than bars and shapes, and to hold to a minimum price of 2.15c, or $3 a ton above some of their recent quotations. However, at least one mill is still quoting plates at 2c. Steel bars, on the other hand, are easier and the 2c. price for car lots has become common. Warehouse prices on steel bars are irregular. A small lot of large round bars has been taken at the 2c. base price by a local warehouse. Hard steel reinforcing bars are weak, the market on these being quotable at 1.90c. for a round lot, or $2 a ton lower than recent prices. Quotations on structural material range from 2.10c. to 2.15c.

Cleveland warehouses quote steel bars at 3.30c. to 3.34c.; plates, 3.60c. to 3.64c., and structural material, 3.40c. to 3.44c.; No. 9 galvanized wire, 4.45c.; No. 9 annealed wire, 3.75c.; No. 28 black sheets, 5.00c.; No. 28 galvanized, 6.00c.; No. 10 blue annealed, 4 00c.

Sheets.—While sheet orders are light, a still better volume of inquiries is coming out. Some of the Detroit automobile manufacturers are getting their surplus stocks used up and are figuring on small lots. Prices quoted by the independent mills are still irregular. Some of the mills are trying to work off large stocks, which policy is affecting prices, as they are offering these stocks at lower prices than they would quote for a mill order. On galvanized sheets as low as 4.60c. has been quoted, the price ranging up to 5c. and higher. The more general quotation on blue annealed sheets by independent mills ranges from 2.75c. to 3c., and on black from 3.75c. to 4c. Automobile body sheets are quoted at 5.20c. for No. 22 gage. A local inquiry for 1500 tons of black sheets is understood to be only for estimating purposes.

High Speed Steel.—There is little activity in high speed steel and prices are weak. Quotations of $1 per ton have become general, but it is reported that a lower price is being named for round lots.

Coke.—The coke market continues dull with the sales limited to car lot orders. Prices are unchanged. We quote the better grades of Connellsville foundry coke at $6 to $7.25 per ton.

Bolts, Nuts and Rivets.—Cleveland rivet manufacturers have further reduced prices $1 a ton to meet the quotations that have appeared in other sections and are now quoting structural rivets at 3.70c. and boiler rivets at 3.80c. Rivet inquiries have improved somewhat, but few orders are being placed. The demand for bolts and nuts continues very light and orders are only for small lots. Prices are unchanged, but it is believed that a good sized inquiry would bring out concessions from present quotations.

Old Material.—After standing about stationary for several weeks, prices on practically all grades of scrap have further declined. Heavy melting steel is fully $1 a ton lower, $13 now being regarded as the maximum price. A few days ago a few small lot sales were made at $13 to $13.50 for delivery to a local mill. Machine shop turnings have sold in Cleveland for

Pittsburgh district delivery at $10, or $6.70 at shipping point. Occasionally a mill releases a shipment on or purchases one or two carloads of scrap, but with these exceptions there is virtually no demand from consumers. One Ohio mill has asked dealers to revise contracts for heavy melting steel, bought at high prices, to the present market prices, but dealers are showing no disposition to do this.

We quote delivered to consumers' yards in Cleveland and vicinity, per gross ton, as follows:

Heavy melting steel	$12.50 to $13.00
Steel rails, under 3 ft.	15.00 to 15.75
Steel rails, rerolling	16.00 to 17.00
Iron rails	15.00 to 16.00
Iron car axles	24.00 to 25.00
Low phosphorus melting scrap	15.00 to 15.50
Cast borings	9.00 to 9.25
Machine shop turnings	6.00 to 7.00
Mixed borings and short turnings	8.00 to 8.50
Short turnings for blast furnaces	8.00 to 8.50
Compressed steel	10.00 to 11.00
Railroad wrought	14.50 to 15.00
Railroad malleable	14.00 to 15.00
Steel axle turnings	10.00 to 10.50
Light bundled sheet stampings	6.00 to 7.00
Drop forge flashings over 10 in.	7.00 to 8.00
Drop forge flashings under 10 in.	8.00 to 9.00
No. 1 cast	17.00 to 18.00
No. 1 busheling	8.00 to 9.00
Railroad grate bars	14.50 to 15.50
Stove plate	14.50 to 15.50
Cast iron car wheels	15.00 to 15.25
Pipes and flues	8.00 to 9.00

Cincinnati

CINCINNATI, March 22.

Pig Iron.—The American Radiator Co. is in the market for 1250 tons of foundry iron, 500 of which is for its Birmingham plant and the remainder for Detroit and Titusville. An Indiana melter is inquiring for 200 tons of Southern iron for second quarter shipment. Five hundred tons are also wanted by a Pennsylvania melter. With the above exceptions inquiries are confined exclusively to car load lots. Sales reported during the week included one of several hundred tons of foundry iron for immediate shipment to a melter whose plant is at present closed down, but who believed that, with the number of furnaces out of blast and the comparatively small tonnages piled on furnace yards, this was a good time to cover for the grade of iron he would need on resumption of business.

This iron was sold on a $27, Ironton, basis, which is still the minimum for southern Ohio iron. The Southern market is now definitely established at $25, Birmingham, for the base grade, and carload lots can be had at this figure. In some cases silicon differentials are being waived, and Southern iron with silicons running over 2.75 are being offered at the same price as No. 2 soft. Some further releases of suspended tonnages are being received from foundries catering to the automotive industry. In some sections of this territory, the melt of iron is gradually increasing, but locally the deadlock between employers and employees continues. Negotiations between the stove foundries and their employees regarding wage scales will be resumed about April 1.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$29.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	30.75
Ohio silvery, 8 per cent sil.	42.52
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	29.52
Basic, Northern	27.52
Malleable	29.52

Finished Material.—Few changes are reported in the finished material market. Light rails have been in fairly good demand from mining operators of Kentucky and West Virginia, and some fairly good tonnages have been taken. Quotations on light rails range from 2.50c. to 2.75c., the lower price being generally quoted by independent interests. On other finished products, prices have not changed materially from those in effect last week, although it is reported that two of the larger independents have announced that they will not take any business under the Steel Corporation prices. It is reported that an order for 700 tons of bars, shapes and plates, was taken by a Valley mill at a flat 2c. price for all material. It is also reported that a price of 3.75c. was made on black sheets in this district. Ruling prices, however, on the sheet business now being placed which consists mostly of carload lots, are 3c. for blue annealed 4c. for black and 5c. for galvanized. Some activity is noticed in the structural market. The McClintic-Marshall Co. has been awarded a contract for the International Nickel Co.'s plant at Huntington, W. Va. This will take about 3000 tons of steel. The same company has been awarded 100 tons for lock No. 45 in the Ohio River, near Cincinnati. The Dayton Steel Co. will fabricate 100 tons for the Greeno building in Cincinnati. Bids are being taken on an eight-story addition to the Lincoln Hotel in Indianapolis, in both steel and reinforced concrete. Some trestle work for the Sloss-Sheffield Steel & Iron Co. is expected to be up shortly and a building for the Indiana State Fair and an armory for the Indiana National Guard will likely go ahead this summer. The proposed high school building for Newport, Ky., involving an expenditure of $300,000 will not go ahead this year, so far as present plans have been determined.

Plant Operations.—Plant operations in this district are steadily increasing. The blooming and bar mills of the Andrews Steel Co., Newport, Ky., will start up next week on a 65 per cent operation. The sheet mills of the Newport Rolling Mill Co. which have been closed for some weeks, will also be operated at about 65 per cent of capacity. The bar mill of the Ashland Steel Co. and sheet mills of the Ashland Iron & Mining Co., Ashland, Ky., have been put in part operation. Jobbing mills of the Whitaker-Glessner Co. at Portsmouth, are running about 35 per cent The plant of the Kelly Nail & Iron Co,, Ironton, Ohio, has been closed down, following a demand of employees of the galvanizing department for increased wages.

Warehouse Business.—No appreciable change is noticed in the warehouse business. Buying is only for immediate needs, though occasionally car load inquiries are being received, principally from points further South. No price changes are reported and local jobbers continue to quote:

Iron and steel bars, 3.58c. base; shapes, 3.68c. base; hoops and bands, 3/16 in. and lighter, 4.28c.; plates, 3.88c. base; reinforcing bars, 3.65c.; cold-rolled rounds, 1½ in. and over, 5.20c.; under 1½ in. rounds, flats, squares and hexagons, 5.70c.; No. 10 blue annealed sheets, 4.78c. base; 28-gage black sheets, 6c. base; 28-gage galvanized sheets, 7c. base; wire nails $3.75 per keg, base.

Coke.—There is a limited demand for carload lots of foundry coke for prompt shipment. Best grades of Connellsville foundry are quoted at $6.50, and Wise county at $7.50. New River foundry is quoted at $10. The Indianapolis by-product producer is quoting $7.50, Connellsville basis and Ashland ovens $7.

Old Material.—There is very little activity in the scrap market. Some plants are releasing suspended tonnages but are naming almost impossible deliveries. Buying of small tonnages to even up prices constitutes the present activity. Prices are off from 50c. to $2 on practically all grades. A local dealer bought a small tonnage of relaying rails at about $34, delivered Cincinnati, and axle turnings have been sold at $9.50. The Chicago & Northwestern is reported to have withdrawn its latest list because of the low bids received.

We quote dealers' buying prices:

Per Gross Ton	
Bundled sheets	$7.50 to $8.50
Old iron rails	16.50 to 17.50
Relaying rails, 50 lb. and up	30.50 to 31.50
Rerolling steel rails	11.50 to 12.50
Heavy melting steel	10.00 to 11.00
Steel rails for melting	10.50 to 11.50
Car wheels	14.50 to 15.50
Per Net Ton	
No. 1 railroad wrought	10.50 to 11.50
Cast borings	5.50 to 6.00
Steel turnings	4.00 to 4.50
Railroad cast	13.50 to 14.50
No. 1 machinery	13.50 to 14.50
Burnt scrap	8.00 to 9.00
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	10.50 to 11.50
Pipes and flues	7.50 to 8.00

The foreign exchange problem has been studied by Vice-President S. Stern of the Columbia Trust Co., New York, which has published the results. The work tells the story of the foreign exchanges during the last six years, and it is illustrated by charts and tables. A copy can probably be had by addressing the company.

The Falcon Steel Co., Niles, Ohio, has declared the regular dividends of 2 per cent on common stock and 1¾ per cent on preferred.

Boston

BOSTON, March 22.

Pig Iron.—A sale of 200 tons resale eastern Pennsylvania No. 1X at $29.50 delivered Connecticut consuming point, shipment from Massachusetts, one of approximately 100 tons regular furnace No. 2X at $27.50 furnace, a car of regular silicon 2.75 to 3.25 at $30 furnace base, and a car of resale Buffalo No. 2X at a private firm offer, constitute the total business known to have been transacted here this week. A Worcester, Mass., consumer claims resale eastern Pennsylvania No. 2X is offered at $28 on cars Worcester, and a Connecticut consumer, at $24 furnace base, but no sales at such prices are reported. Certain eastern Pennsylvania and Buffalo furnaces have instructed local representatives not to sell at less than $26 and $30, respectively, furnace base, hereafter. An effort is being made to introduce French pig iron into New England, which can be done on a $27, duty paid, f.o.b. domestic dock basis. Charcoal iron is scarcer. New England furnaces are out of blast and less than 25 per cent of the Lake Superior district in blast with the amount of unfilled business on their books greater than the available tonnages. Another Lake Superior district furnace will go out of blast April 1. The market on Lake charcoal iron is $35 to $37 furnace. Delivered pig iron prices follow:

East. Penn., sil. 2.25 to 2.75	$29.06 to $31.31
East. Penn., sil. 1.75 to 2.25	28.06 to 30.06
Buffalo, sil. 2.25 to 2.75	31.46 to 36.71
Buffalo, sil. 1.75 to 2.25	30.46 to 35.46
Virginia, silicon 2.25 to 2.75	35.83 to 40.83
Virginia, silicon 1.75 to 2.25	34.58 to 39.58
Alabama, silicon 2.25 to 2.75	39.41 to 41.91
Alabama, silicon 1.75 to 2.25	38.16 to 40.66

Finished Material.—General business shows improvement, but is not active. Orders, ranging from car-lots to 200 tons, are more common. One independent mill resorted to allotments this month and its local office practically has filled its quota. The Lackawanna Steel Co. is again quoting prices. Bars, shapes and plates usually are taken at 2.10c. f.o.b. Pittsburgh. Rumors of lower prices exist, however, one consumer claiming 400 tons bars offered at 1.75c., Pittsburgh. One mill, at least, has freely offered structural steel to old customers at 2c., Pittsburgh. Orders are scarce, however, and mills will accept as low as five tons or less. A Boston school, 400-ton structural steel order, remains unfilled. Bids are asked on 41 tons for a Boston bridge and Stone & Webster ask bids on 75 tons for an El Paso power house. Boston & Maine and New Haven railroads have temporarily held up further bridge work. Quotations on plates range from 2c. to 2.40c., Pittsburgh, small tonnages being booked at these prices this week. A New Hampshire water system project, involving 400 to 500 tons plates, is indefinitely postponed. The Maine Central Railroad has purchased 700 tons of tie plates. The Boston & Maine has bought 2700 tons from the Bethlehem Steel Co., but has not closed on track bolt and angle iron requirements. New England made wire netting is offered at slightly lower than f.o.b. Pittsburgh quotations. Belgian billets have been offered a Maine company at $28 delivered.

Warehouse Business.—A further slight increase in the movement of iron and steel out of warehouse is noted this week. Orders continue for small amounts, however. Some concerns are also doing better in bolts and nuts and have been obliged to place filling in orders with mills. Local stocks of nails are considerably smaller than on March 1. Warehouses in some cases have asked deferred shipments on wire nail contracts and have purchased small tonnages at $3 f.o.b. Pittsburgh, to fill present requirements. Sheets are moving better, but business is spotty. Warehouse prices are unchanged.

Jobbers now quote: Soft steel bars, $3.53 per 100 lb. base; flats, $4.40 to $4.75; concrete bars, $3.53 to $3.75; tire steel, $4.50 to $5; spring steel, open hearth, $6; crucible, $12; steel bands, $4.23 to $4.88; steel hoops, $4.90; toe calk steel, $5.50; cold rolled steel, $5 to $5.75; structural, $3.53 to $4.35; plates, $3.83 to $4.08; No. 10 blue annealed sheets, $4.83; No. 28 black sheets, $6.05; No. 28 galvanized sheets, $6.95; refined iron, $3.53 to $5.40; best refined, $5; Wayne, $8.50; Norway, $12.

Coke.—The market is more settled. Both the Providence Gas Co. and the New England Coal & Coke Co. quote spot foundry coke at $12.66, delivered. On contracts for 600 tons and over, both quote $12.29 delivered, and for smaller tonnages, $12.66. These prices have brought out renewed offerings of excellent quality Connellsville foundry coke in Connecticut on a basis of $5.50 to $6 Connellsville oven, or $1 cheaper in the case of $5.50 than the New England product. The demand for fuel, however, is still limited, the average foundry, based on present operations, having sufficient to carry it for some time.

Old Material.—The market practically is at a standstill and prices continue to ease off under their own weight. New England foundries are able to secure strictly No. 1 machinery cast, in wagon lots, delivered, at or in the neighborhood of 60c. per 100 lb., consequently they are not buying from large dealers. A number of New England yards are closed, due to the lack of business. Industrial concerns owning old material are not willing to sell at prices offered for stock, and Pennsylvania mills are not anxious to buy at any price, all of which explains the present condition of the market. Local yard prices on old material follow:

No. 1 heavy melting steel	$7.50 to $8.00
No. 1 railroad wrought	13.50 to 14.00
No. 1 yard wrought	11.50 to 12.00
Wrought pipe (1-in. in diameter, over 2 ft. long)	9.00 to 9.50
Machine shop turnings	4.50 to 5.00
Cast iron borings, rolling mills	5.00 to 5.50
Cast iron borings, chemical	6.00 to 6.50
Heavy axle turnings	6.00 to 6.50
Blast furnace borings and turnings	4.00 to 4.50
Forged scrap and bundled skeleton	5.50 to 6.00
Street car axles and shafting	17.00 to 18.00
Car wheels	19.00 to 20.00
Machinery cast	19.00 to 20.00
No. 2 cast	17.00 to 18.00
Stove plate	14.00 to 15.00
Railroad malleable	13.00 to 13.50
Rerolling rails	11.00 to 12.00

Birmingham

BIRMINGHAM, ALA., March 22.

Pig Iron.—Small lots for prompt delivery constitute the Birmingham iron market. The largest lot sold in two weeks was 500 tons and there was only one anything like that in size. The single encouraging feature of the market is that every second to third order seems to come from a new customer or one who has not been in the market in some time. This is regarded as indicating that the number of small foundries running out of supply is increasing. The usual car lot sale is made at $26 and $27.50 was gotten in some instances last week, but the market is on a $25 base for any real tonnage. There is also understood to be a disposition by some makers to reduce the silicon differentials on high-grade iron, which would react as a reduction of the base price and be tantamount to the old fracture differences. Sales have been principally in the South and Southwest, where structural operations have begun to assume real proportions with accompanying reflex action. The trend in that direction is very marked and seems headed to substantial totals if present low price levels for materials are maintained. Such foundries as stove plants have found it difficult to maintain operations and some are preparing to cease unless there is an improvement. Some more pig iron is to move to the Pacific Coast by vessel out of Mobile on a saving of $8 per ton in the freight rate and arrangements are about perfected for shipping a tonnage to Cuba under especially arranged shipping rates and handling.

We quote per gross ton f.o.b. Birmingham district furnace, as follows:

Foundry, sil. 1.75 to 2.25	$25.00 to $26.00
Basic	24.00 to 25.00
Charcoal	40.00

Plant Activities.—The Gulf States Steel Co. has operated its nail mill a few days at a time and the bar mill in order to even up stocks on hand, but new business is not such as to indicate regular operations yet. The Tennessee company is doing very little in plate mills, but the rail mill is busy and the car works are operating. The present steel plant production is about 50 per cent of capacity. Both car plant and rail mill are understood

to be well-supplied with orders. Hoop and band mills are operating in Birmingham, but not at other points. Some business with Mexico is reported.

Cast Iron Pipe.—Water and gas pipe manufacturers seem to feel a trifle more optimistic as to prospective business owing to municipal betterment activity in the Southern states. A cargo of 3000 tons of pipe has just moved to the Pacific Coast out of Mobile by water and a similar lot is there waiting on ship. The United States Cast Iron Pipe & Foundry Co. and American Cast Iron Pipe Co. are principal movers of this pipe. Anniston sanitary pipe molders have accepted wage reductions and resumption at Emory and Eastham shops is scheduled. Average sanitary pipe production is not one-third of capacity. Water and gas pipe schedule is still nominally $55.

Coal and Coke.—The coke market is soft with good grades of foundry coke selling at $7.50. Steam coal is still slower and production has fallen from over 300,000 tons to about 215,000 per week. Railroads and industrial plants are overstocked and cannot take on more. Mexico smelter interests are inquiring for 1500 tons of coke and will be accommodated.

Old Material.—Purchasers of steel scrap are out of the market and those of No. 1 cast have quit making inquiries for the time being.

We quote per gross ton f.o.b. Birmingham district yard, as follows:

Old steel rails	$13.00 to $13.50
No. 1 heavy steel	12.50 to 13.00
No. 1 cast	18.00 to 19.00
Car wheels	18.00 to 19.00
Tramcar wheels	16.00 to 17.00
No. 1 wrought	15.00 to 16.00
Stove plate	12.00 to 12.50
Cast iron borings	5.00 to 6.00
Machine shop turnings	5.00 to 6.00

Buffalo

BUFFALO, March 22.

Pig Iron.—A local furnace has been approached from two sources and asked to name a price on a large tonnage of pig iron unquestionably for speculative purposes. The tonnage is not indicated nor the identity of the prospective buyers known. This is taken to mean that certain speculators believe the bottom has been reached and that the time is opportune to buy. Sales are no better. One carload was sold in a week by one furnace, and a small quantity of resale 2.25 to 2.75 grade was moved at $28.25, and 2.75 to 3.25 grade was sold at $29.50. The same interest has inquiries on hand for 7500 tons, very little of which materialized into actual orders. A sales interest reports no sales and inquiries for 3000 tons of foundry, 400 tons of malleable and one inquiry for 200 tons of foundry. One interest holds firm to the $30 base price but sees no business.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	$31.00 to $33.00
No. 2X foundry, 2.25 to 2.75 sil	29.25 to 31.25
No. 2 plain, 1.75 to 2.25 sil	28.00 to 30.00
Basic (nominal)	30.00
Malleable (nominal)	32.00
Lake Superior charcoal	40.64

Finished Iron and Steel.—The resumption by some automobile plants has aided local sheet mills and a better feeling is apparent. One interest will start a 14-in. bar mill April 1, to run off some accumulated orders. The operation program has not been determined, but enough tonnage to run several weeks is in sight. The same plant is now shut down tight. Inquiry with this interest has brightened for a few days, but quantities on which prices are asked are for trifling lots. A wire making industry continues busy with inquiry coming in about 60 per cent normal. An interest has a number of sheet inquiries for less than carload lots. The ruling price on galvanized sheets is about 5c. The market seems to be firmer. Considerable structural figuring is going on but orders do not develop. A structural mill shut down Monday, March 21, for two weeks. An increase in inquiry is noted on cold finished material as on bolts, nuts, and tin plate, but there is little movement of these materials. A slight flurry in sheet business for export trade is noticed. The lowest bar price heard of is 2.10c., but little business. A local erector is figuring on considerable tonnage for use in a hotel to be erected at Williamsport, Pa., but no action has taken place. Warehouse prices on sheets have been revised.

Jobbers quote prices f.o.b. Buffalo as follows: Structural shapes, 3.60c.; plates, 3.80c.; plates, No. 8 gage, 4.60c.; soft steel bars and shapes, 3.50c.; hoops, 4.60c.; blue annealed sheets, No. 10 gage, 4.60c.; galvanized steel sheets, No. 28 gage, 7c.; black sheets, No. 28 gage, 5.65c; No. 9 gage annealed wire, 4.40c.; wire nails, $4.35 per keg; cold rolled strip steel, 8.25c.

Old Material.—Possibility of further reduction in prices is seen in the refusal of one buyer of heavy melting steel to offer more than $10. The same buyer has been fairly active in buying and willingly paid $14 to $15 only a few weeks ago. The same apathy with buyers is noted and trading between dealers has fallen off. We have revised and reduced prices.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$11.50 to $12.50
Hydraulic compressed	10.00 to 11.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 17.00
Car wheels	18.00 to 19.00
Railroad malleable	12.50 to 13.50
Machine shop turnings	8.50 to 9.50
Heavy axle turnings	11.00 to 12.00
Clean cast borings	8.50 to 9.00
Locomotive grate bars	11.50 to 12.50
Wrought pipe	10.50 to 11.50
No. 1 busheling	9.50 to 10.50
Stove plate	18.00 to 19.00
Bundled sheet stampings	7.00 to 8.00

Philadelphia

PHILADELPHIA, March 22.

A new low level for basic pig iron has been established by the sale of 1500 tons to a Delaware steel maker at $25, delivered, or $23.76, furnace. Otherwise the pig iron market is barren of developments of interest.

In the steel trade a very limited business is being done, in most instances smaller than a month ago. Bookings by those companies which are operating mills are considerably below current shipments. Prices continue weak. On an inquiry from the Norfolk & Western Railroad for several hundred tons of plates, shapes and bars, two companies quoted 2c., Pittsburgh, on plates, and there were quotations of 2c. on bars and structural shapes. There were also quotations of 2.10c. and 2.25c. The 2c. quotation on structural shapes is the lowest reported in this market.

Automobile manufacturers are showing a mild form of interest in steel, as is evidenced by the inquiry of the Ford Motor Co. for 500 tons of forging billets and the reinstatement of a few orders for bars. One alloy bar mill, which has been idle for months, will start up on a 500-ton order which has been reinstated.

The Midvale Steel & Ordnance Co. on next Monday will start up five open-hearth furnaces and a plate mill at its Coatesville plant. This is being done to provide work for employees, rather than because of any demand for the products of the plant. Unless new business develops, the operation will be continued only a week or ten days.

Pig Iron.—The most important transaction of the week was the sale of 1500 tons of basic iron to a Delaware steel company at $25, delivered, the freight rate being $1.26. This iron is for March and April shipment. An offer of the same price for May shipment was declined by the seller. In foundry iron there is very slight activity, possibly 2000 tons or more having been sold during the week in small lots. Prices range from $25 to $26, furnace, for No. 2 plain iron, the higher price being quoted mostly on carload lots. On 100 tons or more $25, furnace, is easy to obtain. Only three regular merchant furnaces in eastern Pennsylvania are now in blast, the Crane stack having been blown out. Two of the furnaces now in blast will go out in 30 days unless there is a revival of buying interest. These furnaces have made out fairly well in the last two or three months because of having some higher priced tonnage on their books, which has kept their average shipping price above cost of production. At $25, it is stated, no furnace in eastern Pennsylvania

can come out whole and the two stacks referred to will probably not be operated when the average shipping price gets below the cost line. Oxford furnace has been blown in on basic iron.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa. No. 2 plain, 1.75 to 2.25	$26.26 to $26.84
East. Pa. No. 2X, 2.25 to 2.75 sil.	27.26 to 27.84
Virginia No. 2 plain, 1.75 to 2.25 sil.	33.74 to 35.74
Virginia No. 2X, 2.25 to 2.75 sil.	34.99 to 36.99
Basic deliv. Eastern Pa.	25.00
Gray forge	26.26
Standard low phos. (f.o.b. furnace)	41.50
Malleable	29.90
Copper bearing low phos. (f.o.b. furnace)	40.00

Ferroalloys.—There is no activity in ferromanganese and spiegeleisen. Prices are nominal, $90 for domestic ferromanganese, delivered, and $35, furnace, for spiegeleisen.

Coke.—Foundry coke is quoted at $5.50 to $6, Connellsville, depending upon quality.

Plates.—The plate market continues exceedingly dull. There is not enough inquiry in the East to test prices, but the Norfolk & Western Railroad, which requested bids on several hundred tons of plates, shapes and bars, was quoted 2c., Pittsburgh, by two independent makers, 2.10c. by two or three others, and as high as 2.25c. by some. The business has not been placed. A Youngstown company, which has been meeting competition on plates, has decided to withdraw its low prices and now names 2.25c., Pittsburgh, as the minimum at which it will accept orders. We quote plates, ¼ in. and heavier, at 2c. to 2.10c., Pittsburgh.

Structural Material.—Bids of 2c., Pittsburgh, were received by the Norfolk & Western Railroad on shapes for car work, this being the lowest price formally named in this market. Some quotations were from 2.10c. to 2.25c. Local fabricators report that inquiries for structural work are not as active as a few weeks ago, prospective builders apparently awaiting lower prices, despite the fact that some figures on fabricated work are on a low basis considering the cost of the plain material and labor. Figures have been submitted around $90, fabricated and erected.

Bars.—Because of the fair-sized stocks of bars carried by some consumers whose wants would normally be felt at this season of the year, such as the agricultural implement manufacturers, for example, the small demand for this form of steel is exceedingly discouraging to the mills. The only favorable indication is the reinstatement of some small orders by automobile and parts manufacturers, but the total of such reinstated orders is insignificant. One alloy steel bar mill has been started up on a 500-ton reinstated order and immediate shipment is requested. Most of the bar iron makers are now quoting 2.10c., Pittsburgh, but this price has failed to bring out any appreciable business.

Sheets.—A Youngstown company has withdrawn from the market on sheets by renaming the Industrial Board prices as the minimum at which it will sell. Current business consists of a meager number of small orders which are being booked at about 3c. to 3.20c. for No. 10 blue annealed; 3.85c. to 4c. for No. 28 black, and 5c. to 5.15c. for No. 28 galvanized., f.o.b. Pittsburgh.

Warehouse Business.—Local warehouses are getting about the normal number of orders, but the quantities ordered are so small that the total tonnage being booked is only about 25 per cent of normal. We quote as follows for local delivery, while for points outside of Philadelphia a reduction of $3 per ton from these prices is allowed to cover transportation costs.

Soft steel bars and small shapes, 3.45c.; iron bars (except bands), 3.45c.; round edge iron, 3.75c.; round edge steel, iron finish, 1½ in. x ½ in., 3.75c.; round edge steel, planished, 4.50c.; tank steel plates, ¼-in. and heavier, 3.45c.; tank steel plates, 3/16-in., 3.75c.; blue annealed steel sheets, No. 10 gage, 4.65c.; light black steel sheets, No. 28 gage, 5.75c.; galvanized sheets, No. 28 gage, 7c.; square twisted and deformed steel bars, 3.55c.; structural shapes, 3.55c.; diamond pattern plates, 5.50c.; spring steel, 5.00c.; round cold-rolled steel, 5.00c.; squares and hexagons, cold-rolled steel, 5.50c.; steel hoops, No. 13 gage and lighter, 4.25c.; steel bands, No. 12 gage to 3/16-in. inclusive, 4.15c.; iron bands, 4.75c.; rails, 3.45c.; tool steel, 16c.; Norway iron, 10c.; toe steel, 4.50c.

Semi-Finished Steel.—Eastern mills quote $38.50 for open-hearth rerolling billets and $43.50 for forging billets, though it is intimated that the latter price can be shaded. The Ford Motor Co. is in the market for 500 tons of forging billets.

Old Material.—Small lots of heavy melting steel have been sold the past week at $13, delivered, and the company which has been making these purchases now offers only $12.50. Cast borings have been sold at $9 and machine shop turnings at $9.50, delivered, a reduction of $1 a ton in each instance from last week's quoted prices. Forge and skeleton scrap are also lower. We quote for delivery at consuming points in this territory as follows:

No. 1 heavy melting steel	$13.00 to $13.50
Steel rails, rerolling	17.00 to 18.00
No. 1 low phos., heavy 0.04 and under	19.00 to 20.00
Car wheels	18.00 to 20.00
No. 1 railroad wrought	17.00 to 18.00
No. 1 yard wrought	15.50 to 16.00
No. 1 forge fire	12.00 to 12.50
Bundled skeleton	9.50 to 10.00
No. 1 busheling	13.50 to 14.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	8.50 to 9.50
Mixed borings and turnings (for blast furnace use)	8.50 to 9.50
Machine-shop turnings (for rolling mill and steel works use)	9.50 to 10.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for rolling mills)	9.00 to 10.00
Cast borings (for chemical plants)	11.00 to 12.00
No. 1 cast	19.00 to 20.00
Railroad grate bars	15.00 to 16.00
Stove plate (for steel plant use)	15.00 to 16.00
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.50 to 15.00
Iron car axles	No market
Steel car axles	No market

San Francisco

SAN FRANCISCO, March 16.

Pig Iron.—The Coast market continues very dull, with prices practically nominal. Foundries are doing a little work and occasionally taking a carload, but this is decidedly inconsequential. Eastern furnaces are quoting at about $26 to $28 at their plants, but even concessions do not interest buyers. The principal reason for the prevailing stagnation in pig iron, other than general conditions, seems to be the liberal stocks of Scotch and domestic pig iron on the Coast. The import business of late has been very small, with occasional single cars being reported.

Coke.—The closest approximation to a feature in this market of late was the placing of an order for 2000 tons of coke at the current market level of about $23.50 net ton, delivered San Francisco. In other respects the market remains quiet, with a routine, small volume business being done. Occasionally a sale of carload quantity is reported. As in the case of pig iron, Coast stocks are heavy. It is estimated that foundries are operating at approximately 30 per cent capacity.

Old Material.—A depressed condition prevails in the scrap market, and business is almost completely paralyzed. There is nothing moving and mills are practically closed down, to continue in this condition indefinitely. Under these circumstances, prices are nominal, and it is difficult to estimate the market correctly. Heavy melting steel has declined to about $12 per gross ton delivered at the mill, and cast iron scrap is quoted from $30 to $32.50. Stocks of scrap on hand are not exceedingly heavy, but still quite ample for possible requirements.

Cast Iron Pipe.—A rather better condition exists in the market for pipe, especially in the southern part of the State. Considerable construction is being done, and municipalities are placing orders. Activities are of less consequence in San Francisco and northern California, but there are a few inquiries and fair prospects. In this connection it may be mentioned that San Francisco failed to authorize the purchase of the Spring Valley Water Co., which seemed to promise a greatly extended water and power supply. Stocks of pipe in general are fairly low on the Coast, and buyers are showing a disposition to cover immediate needs only. Cast iron pipe continues to be offered at $55 base per ton, Birmingham. It is announced that Phoenix, Ariz., is in the market for upward of 4000 tons; bids are called for the early part of April. The steamer "Cape

Henry" arrived at Coast points this week carrying 2000 tons for representative interests.

Finished Iron and Steel.—Conditions on the Coast are quiet and little business of consequence has been done during the past week. Independents' cutting apparently has exerted a disquieting influence, which has caused jobbers to adopt a waiting attitude and to withdraw almost completely from the market. There is a manifest desire to keep stocks reduced as much as possible, and jobbers depend upon one another for requirements to a considerable extent. There is, however, a better feeling gradually gaining headway, in view of a greater volume of inquiries for materials from railroads, oil fields and miscellaneous building and construction sources. Export demand is likewise small, although some inquiries from Japan for specific jobs have been received, one for about 2000 tons of chain. Hawaii continues a good market. The market on plates and sheets is in a very unstable condition, and may properly be called a buyers' market. Corporation prices have not been maintained, and there is keen competition among most of the manufacturers for the little business offering. Plates and shapes are quoted around $2.25, Pittsburgh, but under the conditions this is necessarily approximate only.

St. Louis

ST. LOUIS, March 21.

Pig Iron.—There has been no revival of interest in the pig iron market during the past week and aside from an occasional sale of a car lot for immediate shipment for some special purpose, there has been no buying. The melters continue in an operation of only about 25 per cent of the total capacity of the St. Louis district and report that no contracts are being made by them as yet for castings.

Finished Iron and Steel.—In finished products there is no activity at all, either among the mill representatives or in the warehouse district.

For stock out of warehouse we quote as follows: Soft iron bars, 3.57½c.; soft steel bars, 3.57½c.; structural material, 3.67½c.; tank plates, 3.87½c.; No. 10 blue annealed sheets, 4.77½c.; No. 28 black sheets, cold rolled one pass, 5.85c.; No. 28 galvanized sheets, black sheet gage, 7.20c.

Coke.—In coke there is a decided listlessness prevalent in the market and no contracts are being made. The quotations from the ovens are about as they have been and the lack of any business to compete for eliminates any possibility of measuring transactions against quotations to determine actual price conditions.

Old Material.—No business is being transacted in the scrap market, not even enough to establish tentative quotation on the various items ordinarily dealt in. Neither consumers nor dealers are inclined to commit themselves because of the uncertainties of the situation, and as there is no demand of any kind developing, the prices are sagging in their tendencies, but there is no basis upon which a quotation can be made. The figures given therefore are only estimates of value. No lists came out during the week from the railroads except an offering of 450 tons of carwheels from the Missouri, Kansas & Texas, closing Wednesday.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard section, subject to inspection	35.00 to 40.00
Old car wheels	16.50 to 17.00
No. 1 railroad heavy melting steel	13.00 to 13.50
Heavy shoveling steel	11.00 to 11.50
Ordinary shoveling steel	10.50 to 11.00
Frogs, switches and guards cut apart	13.00 to 13.50
Ordinary bundled sheet	5.00 to 5.50
Per Net Ton	
Heavy axle and tire turnings	6.00 to 6.50
Iron angle bars	13.00 to 13.50
Steel angle bars	11.50 to 12.00
Iron car axles	27.00 to 27.50
Steel car axles	14.00 to 14.50
Wrought arch bars and transoms	14.00 to 14.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Railroad springs	11.00 to 11.50
Steel couplers and knuckles	11.00 to 11.50
Locomotive tires, 42 in. and over, smooth inside	9.00 to 9.50
No. 1 dealers' forge	8.00 to 8.50
Cast iron borings	7.50 to 8.00
No. 1 busheling	11.50 to 12.00
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
No. 1 railroad cast	15.00 to 15.50
Stove plate and light cast	13.50 to 14.00
Railroad malleable	10.00 to 10.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank	5.00 to 5.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	4.50 to 5.00
Country mixed	7.00 to 7.50
Uncut railroad mixed	8.00 to 8.50
Horseshoes	11.00 to 11.50
Railroad brake shoes	8.00 to 8.50

British Metal-working Industries Seeking Export Trade

Features of Exhibits at the Industrial Fair at Birmingham in Brassworking, Foundry Equipment and Machinery Lines—Advance in Electric Industrial Haulage

(*Special Correspondence*)

LONDON, ENGLAND, March 5.—The London and Birmingham sections of the British Industries Fair, organized by the Board of Trade closed yesterday and the general feeling as to results may be best expressed in the recent words of F. G. Kellaway, Parliamentary secretary to the Board of Trade, as one of restrained optimism. The London section, apart from exhibits of scientific instruments and chemical glassware, was chiefly devoted to "luxury" trades, and it is not surprising that some exhibitors have not been overwhelmed with orders. At Birmingham, however, products of real utility, emanating from the metallurgical industries, were a prominent feature and the results on the whole are regarded as satisfactory. Although this trade fair has been held in a period of acute industrial depression, the opinion of many who are in a position to judge is that the worst point has already been reached. In nearly every department there was a feeling of quiet confidence in the future.

Metal Industries Prominent

The oustanding impression of the Birmingham show, which was excellently arranged in the aerodrome at Castle Bromwich, was the great variety of products turned out by the metal industries of the Midlands—a variety which covers all branches of ferrous and non-ferrous metallurgy, and is probably unequaled in any other industrial center in the world. A careful inspection by your correspondent failed to reveal any signs of falling off in quality. In fact, pre-war standards have not only been maintained, but generally speaking have been surpassed.

The fair was visited by buyers from the home and overseas markets, attendances at Castle Bromwich varying between 3000 and 10,000 per day. Foreign trade missions were entertained from America, Belgium, Bulgaria, Canada, Italy, Czecho-Slovakia, Denmark, Holland, Finland, France, Italy, Norway, Poland, Portugal, Roumania Serbia, Sweden, Switzerland. The principal member of the American delegation was Mr. Irving T. Bush, of the Bush Terminal Co., chairman of the executive committee of the New York Chamber of Commerce.

The comprehensive nature of the exhibits at Birmingham may be judged from the following partial list of the groups: ironmongery and hardware, lighting and heating goods, hollow-ware, metal furniture, metal tubes, pipes, fittings, ingots, sheets, strips, wire, rods, etc.; tools, nautical scientific instruments, machinery belting, ropes, etc.; foundry appliances, weighing and measuring appliances, small machine tools, guns, rifles, revolvers, etc.

Brass and Copper Products

In the brass, copper and nickel-silver trades some 70 manufacturers combined in a joint exhibit which was staged by the five trade associations concerned. The exhibit was distinctly imposing, occupying a stand 80 ft. by 20 ft., the whole of one side consisting of an architectural arrangement of burnished tubes of brass, aluminum and copper. It is claimed that the makers represented on this stand supplied every tube used in the war for admiralty purposes, tubes up to 15 in. diameter being produced. The smallest wire exhibited had a diameter 1-12,000 in., while tiny tubes 1/16 in. across the mouth attracted much notice. An interesting exhibit was a new type of condenser tube made by drawing two tubes one inside the other to check pitting. Other exhibits on this stand were rolled metal, nickel strip, and wire from ½ in. to 5-1000 in. in diameter. The methods of scientific control of manufacture were demonstrated in a special room by a skilled metallurgist.

Another joint exhibit was staged by the Association of Drop Forgers and Stampers, a vigorous organization with between 70 and 80 members. The examples of work shown were typical drop forgings for a variety of purposes, calling for no special comment beyond their general excellence. This class of work is now making great strides in the Midlands.

Foundry Equipment

There was a good display of foundry plant and requisites. The Constructional Engineering Co., Birmingham, showed some improved types of cupola designed for fuel economy and heat control. Regulation is obtained by a double air belt. A "cupolette" with a melting capacity of 30 cwt. per hour claims a coke consumption of about 2½ cwt. per ton. Workmanlike ladles were also exhibited, from a 28-lb. hand ladle to a 15-ton ladle, all the usual types being manufactured. The Adaptable Molding Machine Co., Birmingham, exhibited its specialties in molding machinery, comprising a large range of hand-ram molding machines adaptable to various sizes of molding boxes and suitable for castings from a few ounces up to 1½ cwt. Attachments were shown for various classes of work and for working double-sided plates for turnover work. In contrast to many American and Continental molding machines the working parts are totally enclosed. An interesting exhibit was the Pneulac jar-ram electrically operated molding machine, publicly exhibited for the first time, which is independent of air compressors. With suitable labor and according to the size of the box used, this machine will turn out 40 to 200 molds per day, and it is claimed to be self-contained and foolproof. On the same stand was also shown a new type of roll-over molding and core-making machine, suitable either for a small jobbing foundry or for large scale repetition work for the automobile trade.

Heavy Machinery and Machine Tools

Among the heavy machinery your correspondent was particularly impressed with the range of hydraulic pumps of Hollings & Guest, Ltd., Birmingham, the various types comprising hand, belt-driven, geared, motor-driven, vertical and horizontal pumps, and the usual working pressure being 1600 lb. per sq. in., although any pressure could be arranged for as required. The firm is known also for its hydraulic forging and baling presses.

A newcomer in the power press industry is Kynoch, Ltd., Birmingham, and its exhibit attracted a large number of inquiries during the fair. The presses are of the mechanical type with patent cam clutch.

Mechanical power hammers in variety were staged by Blacker, Ltd., Stalybridge, whose slogan is:

> Under the spreading chestnut tree
> The village smithy stood;
> The place is empty now, you see;
> Old methods were no good!

Power transmission specialties were shown by Arnold Goodwin & Son, Ltd., London, who make a feature of a pressed steel grip bush pulley for all sizes of shafting, while in their "Beatall" compression coupling keys and keyways are eliminated. Gripping power is obtained by a spiral slot, compression being equally distributed over the entire surface covered by the coupling.

In the machine tool department remarkably fine displays were made by Alfred Herbert, Ltd., Coventry, and the Birmingham Small Arms Co., Ltd., Birmingham. General conditions are adverse at the moment, but big business is being opened up in France, Belgium, Spain, Portugal and Denmark, and due attention is being paid to Continental requirements as regards metric measurements. The leading British makers would appear to be able to give a good account of themselves in the face of competition, which is likely to be severe and comes chiefly from the United States.

Electric Industrial Haulage

The use of electrical industrial trucks has been long a feature of works equipment in the United States, and has recently made considerable headway in this country, thanks largely to the activities of the Electric Vehicle Committee of Great Britain which now issues a monthly official publication. Whereas formerly it was necessary for progressive British firms to go to the United States for industrial electric vehicles, there are now several good makers in this country who are able to cater for British requirements. These were represented at the fair by British Electric Vehicles, Ltd., London; W. Goodyear & Sons, Ltd., Dudley; H. C. Slingsby, London, and Ransomes, Sims & Jeffries, Ltd., Ipswich. All the usual types of commercial electric vehicles are covered by the products of these firms, from small parcel carriers to electric lorries. It may be noted that the Home Office has sanctioned the use of electric accumulator tractors in coal mines, and it is anticipated that one tractor will replace six ponies. Experimental installations are now operating in a few mines where it is found that 2000 tons of material per day can be handled by 12 tractors.

Among the other sections of the fair which had highly satisfactory displays may be mentioned the stands devoted to testing and weighing appliances, the gun trade, paints and varnishes, electroplating plant and equipment, and hollowware. In regard to the latter, the great progress of aluminum as a substitute for the ferrous metals is noteworthy.

Hope for Recovering Foreign Trade

Space does not permit a more extended notice, but it is hoped that the above comments will indicate that firms in the Midlands are in fine shape to take part in the revival of trade when it comes.

An excellent summary of the present trade position was given by F. G. Kellaway, of the Board of Trade, in the course of a speech after a tour of inspection of the exhibits at the Birmingham fair, when he said:

> Whilst it is difficult to give definite reasons for optimism in regard to the future recovery of overseas markets, there are signs which point in that direction. This is particularly the case in a number of our Dominions markets. There are Canada, South Africa and Australia who are all showing indications that a renewed demand is commencing. Accumulated stocks are being gradually consumed, and whilst I do not expect anything like a dramatic recovery, I believe there are substantial indications in the direction of a quiet improvement. It is a movement in the right direction. A quiet, steady improvement is what British industry needs, for it has suffered from dramatic and startling changes since the war.
>
> If only our costs of production can be brought down to something nearer the normal, I have no hesitation in expressing confidence as to the future. We cannot too often emphasize the fact that the interests of the working people of this country are vitally concerned with our overseas trade. If our costs of production are so high as to make competition in foreign markets impossible to our manufacturers, then it is the working people who will be the principal sufferers. This fact should be in the mind of every man who is in a position to influence the attitude of labor.

In other words, British manufacturers are not afraid of a trade slump from which all the other industrial communities of the world are also suffering, but they feel that a speedy solution of the economic troubles due to what is politely termed "labor unrest" is essential to the continued well-being of British industry.

Continental No. 1 plant of H. C. Frick Coke Co., which consists of 400 ovens, 275 of which have been in operation, closed down March 19, for the first time in 17 years. The plant is located at the southern end of Uniontown, Pa., and when in full operation gives employment to several hundred men.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	$0.695
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.78
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.33	Pacific Coast, ship plates	1.335
Indianapolis	0.345	Birmingham	0.765
Chicago	0.38	Jacksonville, all rail	0.555
St. Louis	0.475	Jacksonville, rail and water	0.46
Kansas City	0.815	New Orleans	0.515
Kansas City (pipe)	0.78		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 70c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, $1.20; pipe, not over 8 in. in diameter, 85c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2c. to 2.45c.

Wire Products

Wire nails, $3.00 to $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2; bright Bessemer and basic wire, $3.00 to $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00 to $3.25; galvanized wire, $3.70 to $3.95; galvanized barbed wire, $3.85 to $4.10; galvanized fence staples, $3.85 to $4.10; painted barbed wire, $3.15 to $3.40; polished fence staples, $3.15 to $3.40; cement-coated nails, per count keg, $2.60 to $2.85; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 to 63 per cent off list for carload lots, 57 to 62 per cent for 1000-rod lots, and 56 to 61 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.70
Large boiler rivets.....3.80
Small rivets.....60, 10 and 10 per cent off list
Small machine bolts, rolled threads, 60, 10 and 10 per cent off list
Same sizes in cut threads.....60 and 10 per cent off list
Longer and larger sizes of machine bolts....60 per cent off list
Carriage bolts, ⅜-in. x 6-in.:
Smaller and shorter, rolled threads.....60 per cent off list
Cut threads.....50 and 10 per cent off list
Longer and larger sizes.....50 and 10 per cent off list
Lag bolts.....65 per cent off list
Plow bolts Nos. 1, 2 and 3 head....50, 10 and 5 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜-in. x 4-in.:
Smaller and shorter.....45, 10 and 10 per cent off list
Longer and larger sizes.....40, 10 and 5 per cent off list
Hot pressed sq. or hex. blank nuts.....$3.25 off list
Hot pressed nuts, tapped.....$3.00 off list
C. p. c. and t. sq. or hex. nuts, blank.....$3.10 off list
C. p. c. and t. sq. or hex. nuts, tapped.....$2.85 off list
Semi-finished hex. nuts:
¼ to 9/16 in. inclusive U. S. S.....80 per cent off list
Same sizes S. A. E.....80 and 10 per cent off list
⅝ to 1 in. inclusive U. S. S. and S. A. E., 70 and 10 per cent off list
Stove bolts in packages.....75, 10 and 12½ per cent off list
Stove bolts in bulk.....75, 10 and 10 per cent off list
Tire bolts.....60, 10 and 10 per cent off list
Track bolts.....4.90c. base

Square and Hex. Head Cap Screws

½ in. and under.....65 and 10 to 70 per cent off list
9/16 in. to ¾ in.....65 to 70 per cent off list

Set Screws

½ in. and under.....70 and 5 to 70 and 10 per cent off list
9/16 in. to ¾ in.....65 and 10 to 70 per cent off list

One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $57; chain rods, $52 to $57; screw stock rods, $57 to $62; rivet and bolt rods and other rods of that character, $52 to $57; high carbon rods, $63 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $3.25 to $3.65 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $4.25 to $4.50; 5/16-in., $5 to $5.25. Boat and barge spikes, $4.25 to $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $4.50 base per keg of 200 lb. Tie plates, $2.75 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2c. to 2.35c. from mill. Refined bar iron, 2.75c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅜	15½	+11½
½	54½	40	½	24½	6½
¾ to 3	57½	44	¾ to 1½	29½	13½

Lap Weld

2	50½	38	2 to 2½	25½	11½
2½ to 6	53½	41	3 to 6	27½	14½
7 to 12	50½	37	7 to 12	24½	11½
13 and 14	41				
15	38½				

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	¼	+13½	+46½
½	51½	39	⅜	13½	+ 3½
¾ to 1½	55½	43	½	23½	10½
2 to 3	56½	44	¾ to 1½	29½	14½

Lap Weld, extra strong, plain ends

2	48½	37	2 to 2½	26½	13½
2½ to 4	51½	40	3 to 4	28½	16½
4½ to 6	50½	39	4½ to 6	27½	15½
7 to 8	46½	33	7 to 8	19½	7½
9 to 12	41½	28	9 to 12	14½	2½

To the large jobbing trade an additional 1, 5 and 2½ per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ to 2 in.	19½	1¾ to 1⅞ in.	+10
2¼ in.	24	2 in.	List
2½ to 3¼ in.	30½	2¼ in.	—2
3½ to 4½ in.	40½	2½ in.	—6
		2¾ to 3¼ in.	—7
		3½ to 4½ in.	—12

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ and 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.		Cents per Lb.	
No. 8 and heavier	2.95 to 3.45	Nos. 11 and 12	3.05 to 3.60
Nos. 9 and 10 (base)	3.00 to 3.55	Nos. 13 and 14	3.10 to 3.65
		Nos. 15 and 16	3.20 to 3.75

Box Annealed, One Pass Cold Rolled

Cents per Lb.		Cents per Lb.	
Nos. 17 to 21	3.60 to 4.15	No. 28 (base)	3.85 to 4.35
Nos. 22 to 24	3.70 to 4.20	No. 29	3.95 to 4.45
Nos. 25 and 26	3.75 to 4.25	No. 30	4.05 to 4.55
No. 27	3.80 to 4.30		

Galvanized Black Sheet Gage

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	4.00 to 4.70	Nos. 25 and 26	4.70 to 5.40
Nos. 12 to 14	4.10 to 4.80	No. 27	4.85 to 5.55
Nos. 15 and 16	4.25 to 4.95	No. 28 (base)	5.00 to 5.70
Nos. 17 to 21	4.40 to 5.15	No. 29	5.25 to 5.90
Nos. 22 to 24	4.55 to 5.25	No. 30	5.50 to 6.20

Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	4.00 to 4.15	No. 28 (base)	4.20 to 4.35
Nos. 17 to 21	4.05 to 4.20	No. 29	4.25 to 4.40
Nos. 22 to 24	4.10 to 4.25	No. 30	4.25 to 4.40
Nos. 25 to 27	4.15 to 4.30	Nos. 30½ and 31	4.30 to 4.45

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
March	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
16.....	12.12½	11.87½	28.00	4.00	4.00	5.25	4.75
17.....	12.12½	11.87½	28.25	4.00	4.00	5.25	4.75
18.....	12.00	11.75	28.00	4.00	4.00	5.25	4.75
19.....	12.00	11.75	....	4.00	4.00	5.20	4.70
21.....	12.12½	11.87½	28.25	4.00	4.00	5.20	4.70
22.....	12.12½	11.87½	28.50	4.00	4.00	5.20	4.70

NEW YORK, March 22.

Stagnation permeates all the markets and buying is on a very small scale. There is no demand for copper, but prices are fairly steady. The tin market is stationary, with buying confined to dealers. Demand for lead and zinc continues very light, with prices practically unchanged.

New York

Copper.—Buying of copper is so small that quotations are largely nominal and they vary according to the producer or seller involved. Bottom prices for electrolytic continue unchanged at 11.87½c., New York, or 12c., delivered, for prompt and early delivery, ranging to 12.50c. for forward positions. The lower prices are the ones at which small sellers or producers are meeting the little business offered. Larger interests maintain their prices at higher levels. Lake copper is also in light demand, being quoted in the so-called outside market at 12.25c., delivered, with larger producers asking a minimum of 12.75c.

Tin.—The tin market is even more quiet than a week ago, business being confined to transactions between dealers, with consumers making no purchases. Buying by dealers, however, has been less than for some time and prices have been fairly stationary around 28c. for spot Straits, New York, with future shipments at around 29c. The feature of the market has been the scarcity of sellers and their disposition to make practically no concessions. Twenty-five tons of future shipment tin was sold on the New York Metal Exchange early last week at 28.75c. An interesting item is that 99 per cent tin is scarce and there have been relatively good sales recently. The London market as compared with a week ago is practically stationary, with spot standard quoted at £157 per ton, future standard at £160 10s., and spot Straits at £163. Spot Straits tin to-day was quoted at 28.50c., New York. Arrivals thus far this month have been 1483 tons, with the quantity afloat 400 tons, or the smallest in many weeks.

Lead.—Demand for lead is even less than it was a week ago and sellers report hardly any business. Quotations, however, are still firm at 4c., both New York and St. Louis, so far as the leading interest is concerned. Not enough business is being done in the outside market to establish the asking prices, which have recently declined from 4.35c., New York, two or three weeks ago, to 4.25c. or less now, the tendency being slightly downward. Any business being done is acknowledged to be generally put through at 4c., New York.

Zinc.—One of the large sellers states that there has been less inquiry for prime Western the last week than in any week since the war. Buying is confined to hand-to-mouth needs of consumers, and this has been the feature of the market for many weeks. Prime Western is quoted and can be obtained at 4.70c., St. Louis, or 5.20c., New York, for early delivery, with the possibility of shading this slightly on desirable business. Any test of the market on a large scale, however, has not appeared.

Antimony.—Wholesale lots for early delivery are obtainable at 5.25c., New York, duty paid, with some sellers asking as high as 5.50c. Demand is light.

Aluminum.—The leading producer quotes virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery at 28c., f.o.b. plant, with other sellers asking 23c. to 23.50c., New York, for the same grade.

Old Metals.—Prices are slightly off again this week with business very dull. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	11.75
Copper, heavy and wire	11.00
Copper, light and bottoms	9.50
Heavy machine composition	11.50
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	6.00
Lead, heavy	3.75
Lead, tea	2.75
Zinc	3.50

Chicago

MARCH 22.—There has been little buying and prices have undergone little change. Forced offerings of spelter depressed that commodity slightly but resulted in the placing of little business. Buyers who sought to secure their March and April requirements at 4.50c. were largely disappointed. Efforts to cover for the remainder of the year at present market prices have also found little response on the part of sellers. We quote Lake copper at 12.87½c. in carload lots; tin, 31c. to 32c.; lead, 4.15c. to 4.25c.; spelter, 4.90c. to 5c.; antimony, 7.50c. On old metals we quote copper wires, crucible shapes, 8c.; copper clips, 8c.; copper bottoms, 7c.; red brass, 8c.; yellow brass, 5.50c.; lead pipe, 2.75c.; zinc, 2c.; pewter, No. 1, 17c.; tinfoil, 19c.; block tin, 22c., all these being buying prices for less than carload lots.

St. Louis

MARCH 21.—The non-ferrous markets continue very dull with no demand of any consequence. In car lots the quotations are: Lead, 4c.; spelter, 4.75c. In less than car lots the prices are: Lead, 4.50c.; spelter, 5.50c.; tin, 33c.; copper, 13.75c.; antimony, 7c. In the Joplin district the dullness that has prevailed in the ore market has shown little change, as the smelters are still disinclined to buy any more than is actually necessary and are putting no more into storage than enough to protect them against any sudden demand. In consequence the prices have shown no change worthy of comment. On miscellaneous scrap metals dealers' buying prices remain unchanged from last report with no demand evident from any source for scrap material. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 4c.; heavy yellow brass, 6.50c.; heavy red brass, heavy copper and copper wire, 9c.; pewter, 13c.; tinfoil, 20c.; zinc, 3c.; lead, 3.50c.; tea lead, 2c.; aluminum, 10c.

Industrial Cost Association Activities

A Philadelphia section of the Industrial Cost Association is to be organized about April 15. Among those active in the movement is Earl S. Sparks, secretary Metal Manufacturers' Association, Merchants and Mariners Building, Philadelphia.

J. W. Standard, secretary-treasurer American Auto Parts Co., Detroit, has been elected first vice-president of the Industrial Cost Association.

On Thursday evening, March 24, in the Engineering Societies Building, New York, will be held a meeting of the New York chapter of the association.

At the March meeting of the Engineers' Club of Cincinnati, held March 17, moving pictures of the manufacture of ingot iron at the plant of the American Rolling Mill Co., Middletown, Ohio, were shown. The club also discussed the amalgamation of all engineering societies in the city for the purpose of securing a modern club house. At the April meeting it is expected that Herbert Hoover, Secretary of Commerce, will be present and address the members.

PERSONAL

Keith J. Evans, advertising manager Joseph T. Ryerson & Son, was elected president of the Engineering Advertisers' Association at the annual meeting at Chicago on March 8. Mr. Evans succeeds J. J. Arnsfield, advertising manager Fairbanks Morse Co. Other officers elected were: Julius Holl, advertising manager Link-Belt Co., vice-president; D. T. Eastman, advertising manager Eagle-Picher Lead Co., secretary, and J. H. Patterson, district manager P. H. & F. M. Roots Co., treasurer. G. S. Hamilton, advertising manager Conveyors' Corporation of America; Edward I. Pratt, advertising manager Kellogg Switchboard & Supply Co.; Benjamin Brooks, advertising manager Clay Products Association, and W. F. Leggett, advertising manager Webster Mfg. Co., were the new directors elected by the engineering advertisers.

KEITH J. EVANS

Mr. Evans has been with the Ryerson company for eight years, all of that time in the advertising department. Just prior to the entry of the United States in the war, Mr. Evans co-operated with Donald Ryerson, vice-president of the Ryerson company, who organized the "Four Minute Men" as a lobby in favor of military training. When war was declared, the organization was turned over to the Government and became a division of the Committee on Public Information. Mr. Evans was appointed national business manager, with headquarters at Washington, D. C., and served in that capacity until the organization was well under way, when he entered the army, becoming a second lieutenant in the field artillery. As advertising manager of the Ryerson company, Mr. Evans originated the 450-page loose leaf Ryerson steel service book, a very complete and handy current data book covering specifications and prices.

Mr. Holl has been advertising manager of the Link-Belt Co., Chicago, for the past ten years. During the war he was in charge of propaganda to stimulate the morale of shipworkers for the United States Shipping Board, Emergency Fleet Corporation. He started the *Emergency Fleet News*, a weekly newspaper published by the fleet corporation during the war, acting as business manager. After the armistice he was appointed assistant to Director General Charles Piez of the Emergency Fleet Corporation, serving during the period of cancellations and readjustments of shipbuilding contracts. He later returned with Mr. Piez to Chicago and resumed his work with the Link-Belt Co. Mr. Holl is assistant to the president of the Link-Belt Co., as well as advertising manager, and has charge of all sales analysis work besides the sales promotional work of the company.

JULIUS HOLL

Arthur Schroeder, dean of the sales force of LaBelle Iron Works, has announced his retirement from active service. At the request of the company, however, he will remain for a few months in an advisory capacity. Mr. Schroeder has been identified with the steel industry almost continually since 1876, when he entered the employ of Manning, Maxwell & Moore. Later he was with Lovejoy & Co., and in 1886 associated himself with the Standard Iron Co., Bridgeport, Ohio. In 1892 the Standard Iron Co. merged with the Aetna Iron & Steel Co. into the Aetna Standard Iron & Steel Co., and while with this company Mr. Schroeder was associated with W. T. Graham, formerly of the American Can Co., and John A. Topping, now chairman of the Republic Iron & Steel Co. With the absorption of the Aetna Standard Company by the U. S. Steel Corporation, Mr. Schroeder went into business for himself for a few years. In 1903 he identified himself with Labelle Iron Works, with which company he has been actively connected as its New York representative.

Charles O. Dowding, who has been manager of the machine-tool department of Patterson, Gottfried & Hunter, New York, who are liquidating their business, has become manager of the machine-tool department of Peter A. Frasse & Co., Inc., 417 Canal Street, New York, and takes with him the entire tool department organization of Patterson, Gottfried & Hunter. All of the important lines which have been handled by the latter firm will hereafter be represented by Peter A. Frasse & Co., including Rivett grinders and precision lathes, Bradford lathes, Smith & Mills shapers and Champion Tool Works products.

Dr. Charles E. Lucke, professor Gas Engineering School, Columbia University, gave an address on internal combustion engines at a joint meeting of the Boston section, American Society of Mechanical Engineers; the Boston section, American Institute of Electrical Engineers and the Harvard Engineering Society at the Harvard Union, Cambridge, Mass., on Wednesday evening, March 23. Edwin S. Carman, president American Society of Mechanical Engineers, also addressed the members.

Removal of the general offices of the Crucible Steel Co. of America from the Oliver Building, Pittsburgh, to the National City Building, Forty-second Street and Madison Avenue, New York, according to an official announcement of the company, means that hereafter the following officers will be located in New York: Chairman, Horace S. Wilkinson; president, Dr. John A. Matthews; first vice-president, Odin H. Wharton, who was recently elected a director of the company, succeeding A. W. Mellon, who resigned following his appointment as Secretary of the Treasury, and who will be in charge of sales; secretary and assistant treasurer, W. R. Joralemon and purchasing agent, Ray H. Filsinger. The treasury department will go to the New York offices. While the general sales offices of the company will be located in New York, the company will maintain Pittsburgh sales offices with A. L. Ralston, C. E. Hill and C. D. Claney as assistant general sales agents. Rueben Michener, sales agent of the company, and W. D. Wintersmith, superintendent of branch offices, also are going to New York, and will be assistant general sales agents under Mr. Wharton. Gilbert M. Black, vice-president in charge of operations, J. C. Gross, general traffic manager, will remain in Pittsburgh, while headquarters of the Pittsburgh Crucible Steel Co. will be maintained in Pittsburgh, in charge of F. B. Hufnagel, president of that company, and also of the Crucible Fuel Co. with H. E. Zaring, in charge. A branch purchasing office will be retained in Pittsburgh under the direction of W. C. Larimer and F. C. Love.

John W. Mowery, plant engineer Chester Shipbuilding Co., Chester, Pa., has been made general manager of the Worcester Pressed Steel Co. Mr. Mowery is a Cornell man.

Rolland Craten Allen, vice-president of the Lake Superior Iron Ore Association, is to be associated with Oglebay, Norton & Co., miners and shippers of Lake Superior iron ores, whose main office is in Cleveland and iron range office in Ironwood, Mich. Mr. Allen has tendered his resignation to the Lake Superior Iron Ore Association, to become effective Sept. 1, and thereafter will be with the mining department of Oglebay, Norton

& Co. with headquarters at Cleveland. Mr. Allen was appointed vice-president of the Iron Ore Association in the fall of 1919 and has had active charge of important work in connection with taxation and rate matters pertaining to the interests represented in the association. He is a geologist and engineer of broad training and experience. In recent years he has devoted his attention chiefly to the economics of mining with special work in taxation and the theory and practice of valuation of mining property.

J. W. McBurney has resigned as chemist of the Youngstown Sheet & Tube Co., Youngstown, Ohio, to become chief chemist for the Cleveland board of education at its school laboratories.

Charles A. Williams, Cleveland, has been appointed lake traffic manager for the Jones & Laughlin Steel Co. and for the Interstate Steamship Co., which is affiliated with Pickands, Mather & Co. He has been connected with the lake trade about 25 years. He will have charge of the movement of ore and the chartering of vessels.

John H. Nelson, Wyman-Gordon Co., Worcester, Mass., gave a practical talk on drop forgings before the Boston chapter, American Society for Steel Treating at the Engineers Club, March 18.

J. H. Connolly, formerly with the N. C. L. Corporation, Providence, R. I., motors, etc., is now general manager of the Capital Motors Corporation, Fall River, Mass. which has a large and modern plant at Tiverton, R. I.

Carl W. Bettcher has been appointed sales manager of the Eastern Machine Screw Corporation, New Haven, Conn. He will give special attention to the expansion of the H. & G. die head business.

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, Ohio, will resume his duties about April 10, following a stay in Florida.

R. J. Wean has assumed his duties as sales manager of the Aetna Foundry & Machine Co., Warren, Ohio, with which he was identified prior to its reorganization in 1919. Meanwhile Mr. Wean served as sales engineer for the Lakewood Engineering Co., Lakewood, Ohio, at its Pittsburgh office, 859 Union Arcade Building.

Hugh Ferguson, Pittsburgh, has been elected president of the Missouri Iron & Steel Corporation to succeed W. R. Haight, recently resigned. The Missouri Iron & Steel Corporation recently completed a charcoal pig iron blast furnace at Haigart, Mo.

George E. Merryweather, president Motch & Merryweather Machinery Co., Detroit, has become a member of the board of directors of the Davenport Machine Tool Co., Inc., Rochester, N. Y.

Phil Carr, formerly of the sales department of the Cincinnati Planer Co., has accepted a position as sales manager of the H. S. Gray & Co., machinery and supplies, Honolulu, H. I., and will leave for his new position on March 25.

Walter F. Graham has resigned as metallurgist with the Spicer Mfg. Co., Plainfield, N. J., and is now associated with the Henry Souther Engineering Co., consulting, metallurgical, and inspecting engineer, Hartford, Conn. Mr. Graham was formerly associated with the late Henry Souther as metallurgist for the Standard Roller Bearing Co., and subsequently with the Ferro Foundry & Machine Co. and the Ingersoll-Rand Co.

Dean Higgins has been appointed district sales representative by the Eastern Rolling Mill Co., Baltimore, with offices at 906 Union Central Building, Cincinnati, 906-10 Ohio Building, Toledo, Ohio, and 1737-39 Dime Bank Building, Detroit.

Paul Driscoll, general sales manager of the Penn Seaboard Steel Corporation, Philadelphia, and formerly with the Carnegie Steel Co. and the Lackawanna Steel Co. in their Philadelphia offices, has resigned, effective April 1. He will become sales representative in New York and Philadelphia for the Niagara Metal Stamping Corporation, Buffalo, of which C. R. Robinson, formerly general manager of sales of the Lackawanna Steel Co., is the head.

OBITUARY

GEORGE H. HULL, president American Pig Iron Storage Warrant Co., died in Los Angeles, Cal., March 12, at the home of his daughter, Mrs. Richmond Pearson Hobson. Mr. Hull, who was 80 years of age, had not been in good health for some time and recently had submitted to an operation. He was born in Dansville, N. Y., on Nov. 22, 1840, and was first connected with the iron business in a minor position in Cincinnati in 1857. He served in the Civil War and later became bookkeeper of Addy, Hull & Co., in which his brother was a partner. In 1865 he was admitted to partnership and in 1871 withdrew and founded the iron firm of George H. Hull & Co., Louisville, Ky. In 1888 he went to New York and organized the American Pig Iron Storage Warrant Co., becoming its president. As a vigorous advocate of the warrant system, he became widely known. He was a student of economics and the author of a book on "Industrial Depressions."

GEORGE H. HULL

THOMAS DEAN, one of the founders of Dean Brothers Steam Pump Works, Indianapolis, died at his home in that city March 8, aged 79. He was born in Deansboro, N. Y., a town founded by his grandfather, Judge Thomas Dean. He served as a lieutenant in General Sheridan's cavalry during the Civil war. In 1870 he and his two brothers, John Candee Dean and Edward H. Dean, who survive him, went to Indianapolis and established the firm.

ELI MILLETT, inventor of the Millett core oven, and founder of the company which eventually became the Harley Corporation, Springfield, Mass., died in that city March 20. Mr. Millett was a native of Champlain, N. Y., but when a boy moved to Manchester, N. H. There he entered the foundry trade, but later removed to Springfield, where he made his home for 50 years.

JOHN RAHN, JR., president and general manager Rahn-Larmon Co., 2941 Spring Grove Avenue, Cincinnati, died suddenly at his residence in Cincinnati on March 11. He was born in Cincinnati May 1, 1862, and was eduated in the public schools in Cincinnati. At an early age he placed himself under the apprenticeship of the Sebastian Lathe Co., Cincinnati, of which Benjamin Sebastian was president. Later he became foreman and superintendent for the G. A. Gray Co. under the presidency of G. A. Gray. In 1898 he engaged in the lathe manufacturing business for himself at 215 West Pearl Street, Cincinnati. In 1899 he was made vice-president and general manager of the company under the name of Rahn, Mayer, Carpenter Co., of which company he became president under the name of the Rahn-Larmon Co. in March, 1910. He was president of this company up to the day of his death. John Rahn was one of the few pioneers left of those connecting links with pioneer days of machine tool industry in Cincinnati, being a senior member of two other pioneers.

HENRY W. MINNEMEYER, SR., for the past 15 years associated with W. P. Snyder & Co., Pittsburgh, died at his home, 704 Clyde Street, Pittsburgh, March 15, after a brief illness. He was 81 years old and was born and lived all his life in Pittsburgh. For a period of 35 years he was engaged in the manufacture of harness hardware, having conducted a malleable plant in Allegheny. He was first associated with his father-in-law, Samuel Reynolds, under the firm name of Samuel Reynolds & Co., and after the death of Mr. Reynolds in 1877, the firm name was changed to H. W. Minnemeyer & Co.

Production of Pig Iron in the United States in 1920

(From Special Statistical Bulletin No. 1 of the American Iron and Steel Institute)

PRODUCTION OF PIG IRON BY GRADES, 1905–1920.

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1905	4,105,179	12,407,116	4,758,038	635,236	727,817	358,994	22,992,380
1906	5,018,674	13,840,518	4,773,011	699,701	597,420	377,867	25,307,191
1907	5,375,219	13,231,620	5,151,209	920,290	683,167	419,856	25,781,361
1908	4,010,144	7,216,976	3,637,622	414,957	457,164	199,155	15,936,018
1909	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797
1917	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	38,621,216
1918	18,646,174	13,024,966	5,145,260	1,117,914	393,932	726,398	39,054,644
1919	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987

PRODUCTION OF PIG IRON BY STATES, 1916–1920.

States.	1916.	1917.	1918.	1919.	1920.
Maine, Mass., Conn.	5,719	10,527	12,455	13,678	10,281
New York, New Jersey	2,352,535	2,417,527	2,871,118	2,070,288	2,601,134
Pennsylvania	16,506,284	15,539,728	15,198,271	12,276,585	13,983,134
Maryland	501,452	422,212	373,817	244,002	523,733
Virginia	399,885	520,311	513,737	319,409	429,302
Alabama	2,762,885	2,953,705	2,587,852	2,130,092	2,392,962
W. Va., Ga., Ky., Texas	554,590	561,951	594,675	413,091	772,379
Tennessee	355,374	369,951	369,822	190,514	283,207
Ohio	8,602,895	8,518,603	8,764,132	7,102,627	8,533,470
Illinois	3,922,512	3,456,915	3,440,307	2,558,213	3,280,875
Indiana, Michigan	2,221,708	2,657,503	3,073,589	2,715,659	2,939,521
Wisconsin, Minnesota	811,325	738,541	750,366	605,619	711,405
Mo., Iowa, Col., Mont., Wash., Oregon, Cal.	437,633	453,742	504,463	375,587	464,584
Total	39,434,797	38,621,216	39,054,644	31,015,364	36,925,987

PRODUCTION OF PIG IRON BY STATES, 1919–1920.

States.	Production—Gross tons. 1920.	Per cent.	1919.	Per cent.	Increase.	Per cent. increase.
Pennsylvania	13,983,134	37.87	12,276,585	39.58	1,706,549	13.90
Ohio	8,533,470	23.11	7,102,627	22.90	1,430,843	20.14
Illinois	3,280,875	8.88	2,558,213	8.25	722,662	28.25
Indiana, Michigan	2,939,521	7.96	2,715,659	8.76	223,862	8.24
New York, New Jersey	2,601,134	7.04	2,070,288	6.68	530,846	25.64
Alabama	2,392,962	6.48	2,130,092	6.87	262,870	12.34
W. Va., Ky., Texas	772,379	2.09	413,091	1.33	359,288	86.97
Wisconsin, Minnesota	711,405	1.93	605,619	1.95	105,786	17.46
Maryland	523,733	1.42	244,002	.79	279,731	114.64
Mo., Iowa, Colo., Mont., Wash., Oregon, Cal.	464,584	1.26	375,587	1.21	88,997	23.69
Virginia	429,302	1.16	319,409	1.03	109,893	34.40
Tennessee	283,207	.77	190,514	.61	92,693	48.65
Maine, Mass., Conn.	10,281	.03	13,678	.04	*3,397	*24.83
Total	36,925,987	100.00	31,015,364	100.00	5,910,623	19.05

* Decrease.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1916–1920.

Kinds of iron.	1916.	1917.	1918.	1919.	1920.
Cold blast	5,323	5,219	4,209	2,113	1,734
Hot and warm blast	367,088	371,306	344,668	324,984	321,662
Total.....Gross tons.	372,411	*376,525	*348,877	327,097	323,396

* Includes small tonnage made with charcoal and coke mixed in 1917 and 1918.

Classification.—All pig iron and ferroalloys are included, whether made in blast furnaces or in electric furnaces. Pig iron made with bituminous coal is included under coke pig iron. Pig iron made with mixed anthracite and coke is included in anthracite pig iron. Pig iron made with electricity is included in coke pig iron. Low phosphorus pig iron, that is, iron running under 0.04 in phosphorus, is included in Bessemer pig iron. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. The figures for 1913 and subsequent years include under basic iron a small quantity of charcoal iron of basic grade.

PRODUCTION OF PIG IRON BY GRADES, 1919–1920, SHOWING INCREASE BY GRADES.

Grades.	1920.	Per cent.	1919	Per cent.	Increase.	Per cent.
Basic	16,737,722	45.33	14,494,131	46.73	2,248,591	15.48
Bessemer and low phosphorus	12,062,084	32.67	9,975,934	32.17	2,086,150	20.91
Foundry and ferro-silicon	5,957,782	16.13	4,916,758	15.85	1,041,024	21.17
Malleable	1,310,951	3.55	1,009,049	3.25	301,902	29.92
Forge	318,048	.86	271,286	.88	46,762	17.23
Spiegeleisen	111,449	.30	84,246	.27	27,203	32.29
Ferro-manganese	295,447	.80	185,357	.60	110,090	59.39
All other	132,504	.36	78,603	.25	53,901	68.57
Total	36,925,987	100.00	31,015,364	100.00	5,910,623	19.05

PIG IRON MADE FOR SALE BY GRADES IN 1920.

States.	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total Gross tons.
Maine, Mass., Conn.	.....	.....	10,093	.....	.....	46	10,139
N. Y., N. J., Md.	195,795	101,362	829,236	200,909	7,367	16,473	1,351,142
Pennsylvania	752,314	731,099	1,050,706	109,700	71,708	177,689	2,893,216
Va., W. Va., Ala.	271,840	711	1,642,920	.....	18,409	32,595	1,966,475
Ky., Tenn.	9,809	57,861	305,369	6,986	2,366	12,080	394,471
Ohio	589,180	88,060	1,012,444	449,228	52,149	9,219	2,200,280
Ind., Ill.	287,304	115,163	182,276	324,312	.....	14,285	923,340
Mich., Wis., Minn., Mo., Iowa, Montana, Col., Wash.	44,281	.....	727,778	193,356	.....	19,820	985,235
Total	2,150,523	1,094,256	5,760,822	1,284,491	151,999	282,207	10,724,298

METHODS BY WHICH ALL PIG IRON WAS CAST OR DELIVERED.

States.	Molten condition.	Sand cast.	Machine cast.	Chill cast.	Direct castings.	Total. Gross tons.
Maine, Mass., Conn.	.....	10,281	.....	.....	.....	10,281
N. Y., N. J., Md.	1,637,717	574,229	877,730	34,748	443	3,124,867
Pennsylvania	9,518,321	1,033,543	3,050,774	370,242	10,254	13,983,134
Va., W. Va., Ala., Ky., Tenn.	1,223,322	1,913,205	472,866	259,418	9,039	3,877,850
Ohio	4,826,080	622,475	2,973,245	102,126	9,544	8,533,470
Ind., Ill., Mich., Wis., Minn., Mo., Iowa, Montana, Col., Wash.	5,087,970	458,713	1,828,559	17,946	3,197	7,396,385
Total	22,293,410	4,612,446	9,203,174	784,480	32,477	36,925,987

METHODS BY WHICH BASIC PIG IRON WAS CAST OR DELIVERED IN 1920.

States.	Sand cast, machine cast, chill cast, etc.	Molten condition.	Total. Gross tons.
New York, New Jersey	241,798	895,506	1,137,304
Pennsylvania	1,563,695	5,732,560	7,296,255
West Virginia, Alabama, Kentucky	396,799	1,001,899	1,398,698
Ohio	925,450	2,022,861	2,948,311
Indiana, Illinois, Michigan, Minnesota, Missouri, Colorado	459,427	3,497,727	3,957,154
Total	3,587,169	13,150,553	16,737,722

METHODS BY WHICH BESSEMER AND LOW-PHOSPHORUS PIG IRON WAS CAST OR DELIVERED IN 1920.

States.	Sand cast, machine cast, chill cast, etc.	Molten condition.	Total. Gross tons.
New York, Maryland	154,610	742,211	896,821
Pennsylvania	1,175,828	3,779,938	4,955,766
West Virginia, Kentucky, Tennessee, Alabama	205,472	206,051	411,523
Ohio	1,176,165	2,802,622	3,978,787
Illinois, Colorado	238,560	1,580,627	1,819,187
Total	2,950,635	9,111,449	12,062,084

EUROPEAN PLANTS CLOSE

Output Waning in France, Belgium and Luxemburg—Large Stocks of Pig Iron and Coal

LUXEMBURG, March 1.—Despite the downward trend of prices in the continental markets, neither foreign nor domestic consumers show any inclination to place large orders for material. While the price of coal has dropped, the reduction has been insufficient to affect appreciably the price of iron and steel.

It is stated that France has in the Pas de Calais more than 550,000 tons of coal stocked and about 185,000 tons in the Basin of the Loire. Stocks of iron in Chiers and in Lorraine in France are said to total about 300,000 tons and it is believed that almost any reasonable offer to holders of these stocks would result in sales in order to show some turnover of investment.

Numerous plants on the frontiers of France near Germany have either closed down or are operating on part time, notably the Ste. des Hauts Furneaux de Saulnes, now operating with about 150 workers; the Société Lorraine Industrielle, which has blown out two of its blast furnaces; the Société de la Chiers which has only one of its furnaces in blast, and the Acieries de Micheville, which blew out its Villerupt furnace.

In Luxemburg the blast furnaces of Steinfort have released 150 workers and have been partly closed down since March 1. The Rodange works here are now working only six hours a day and throughout Luxemburg smaller plants are partly or completely down.

Export tonnages of semi-finished material are being offered in increasing quantities by Belgian mills. An offer was made about the end of February on a London inquiry of billets at £8 5s. per ton and wire rods at £10 15s, f.o.b. Antwerp. The result of the larger tonnages offered, a wider range of sizes and lower prices has been a slight increase in the export field. Germany also has been active, offering highly acceptable conditions of payment and delivery but with a smaller range of sizes. German offers have been centered upon structural material.

The influx of Belgian iron bars into England has effectively reduced the price of this material there. It is worthy of note that six members of the association of bar producers in England have stated their intention of withdrawing from the association and making their own prices. Belgian bars have brought prices down to about £24 5s. per ton, while the association schedule is still maintained at about 30 shillings higher price. Belgian iron sales however are not large.

Foreign Trade Council Will Co-operate with Secretary Hoover

WASHINGTON, March 22.—That the iron and steel industry will share prominently in the plans of Secretary Herbert Hoover of the Department of Commerce to establish a closer and continuous relationship with the different branches of business is evident by the fact that the National Foreign Trade Council is one of the organizations which he has selected to aid him in co-operating with the department. Not only does the National Foreign Trade Council have a large representation of iron and steel producers, but its chairman is James A. Farrell, president of the United States Steel Corporation. Mr. Hoover announced yesterday that the council is one of the organizations which he has chosen to work with the department. He also has selected a maritime association and other organizations in addition to the initial active step he took last Saturday when he held a conference with several of the directors of the Chamber of Commerce of the United States. The underlying plan, as has been pointed out previously, is to expand export trade, and the Chamber of Commerce of the United States, the National Foreign Trade Council, etc., and individual trade associations, working through them, will act as a point of contact to build up and maintain a comprehensive, broad system in the interest of American foreign trade and of increased efficiency and elimination of waste in industry, which, in turn, fits in with the proposed reorganization of Government departments.

The Chamber of Commerce of the United States is to name a small committee to co-operate with Mr. Hoover and such commercial and industrial organizations as also are concerned, accordin to an official statement issued by Mr. Hoover, in order that a small initial advisory board to the department may be selected which will represent the different elements in American business.

Southern Ohio Pig Iron and Coke Association Meeting

The March meeting of the Southern Ohio Pig Iron and Coke Association was held at the Hotel Marting, Ironton, Ohio, on March 10. The principal business before the meeting was a discussion of the wage question, and safety and accident prevention work to be carried on this year. W. H. Rice, superintendent of the Ironton furnace of the Marting Iron & Steel Co., read a paper on "New Methods of Testing Hardness of Coke," and J. H. Haroldson, Birmingham, Ala., described the operation of the Dovel gas washing machine. Plans were also discussed for the spring meeting of the association to be held in Cleveland about the middle of April, the program for which will be announced later.

Steel Corporation Disappoints Labor Leaders

PITTSBURGH, March 21.—Failure of the Steel Corporation to make a cut in wages has been a real disappointment to the American Federation of Labor committee having in charge the organization of iron and steel plant workmen. It seems that the campaign of the present committee, headed by Michael F. Tighe, which succeeded that led by John Fitzpatrick and W. Z. Foster, which conducted the unsuccessful strike of 1919, was based upon expectations that the Steel Corporation would lead the way in wage reductions, just as it had in wage increases. Plans had been carefully mapped out to use the wage cut as a means of convincing men in the corporation's plants of the advantages of being organized. The drive was to be directed at and centered entirely upon the corporation units, for one of the lessons taught by the 1919 strike was that until workmen of the Steel Corporation were so completely organized as to force official recognition of the unions, it was idle to attempt unionization of the industry at large. So long as the Steel Corporation plants are operated on an open shop basis, success in organizing the independent plants is out of the question. Practically every independent steel company in the country has cut wages, but to date the corporation has maintained the scale which became effective Feb. 1, 1920, when it made an increase of 10 per cent in common labor and a corresponding adjustment in wages of other classes of labor. The organizing committee, therefore, is without ammunition and its activities have been paralyzed by the course pursued by the corporation. As one leader expresses it, "We have to hand it to the corporation; it has ditched our plans."

Will Discharge Railroad Employees

The New York, New Haven & Hartford Railroad Co. on March 24 will lay off approximately 1000 men at its Readville, Mass., shops, 600 at its Hartford, Conn., and about the same number at its New Haven shops, bringing the total number of employees discharged, since the reduction in railroad forces began in 1920, up to more than 11,000. Labor cuts in the locomotive repair department are comparatively small, the burden falling on the car repair department.

Gives Credit to Steel Corporation Price Policy

Chairman Gary, in Annual Report, Expresses Satisfaction in Regard to Course Pursued—Comfortable Earnings in Spite of Heavy Increases in Costs

IN the report of the United States Steel Corporation for the year 1920, Chairman Gary states that the price policy adhered to by the corporation enabled it, notwithstanding substantial increases in costs, to net considerable profits, and to maintain operations at an average rate of 88.3 per cent of total rated capacity for the year. It is evident that the corporation was compelled to carry an unusual financial burden, as its accounts receivable at the close of the year amounted to $149,412,717, compared with $92,806 000 at the close of 1919. Its working capital locked up in inventories, receivables, agents' balances and accounts due from the United States Railroad Administration, shows an increase at the close of 1920 of $81,859,981 over the similar total at the close of 1919. The current assets amount to $702,370,464, of which $123,660,954 is cash. Following are the principal points of the report, which is the nineteenth annual document:

Comparative Income Account

For the Fiscal Years Ending Dec. 31, 1920, and 1919

	1920	1919	+Increase —Decrease
EARNINGS—Before charging interest on bonds and mortgages of subsidiary companies:			
First quarter	$ 44,212,019.49	$ 35,729,326.96	+ $ 8,482,692.53
Second quarter	45,268,551.34	36,520,341.16	+ 8,748,210.18
Third quarter	50,145,301.18	42,327,714.20	+ 7,817,586.98
Fourth quarter	45,469,487.27	37,713,256.92	+ 7,756,230.35
Total for year	*$185,095,359.28	*$152,290,639.24	+ $32,804,720.04
Less interest on outstanding bonds and mortgages of the subsidiary companies	8,408,460.87	8,701,576.72	— 293,115.85
Balance of earnings	$176,686,898.41	$143,589,062.52	+ $33,097,835.89
Less charges and allowances for depletion and depreciation applied as follows, viz.:			
To depreciation and replacement funds and sinking funds on bonds of subsidiary companies	38,245,601.92	37,608,819.42	+ 636,782.50
To sinking funds on U. S. Steel Corporation bonds	8,438,762.40	7,937,107.01	+ 501,655.39
Net income in the year	$130,002,534.09	$ 98,043,136.09	+ $31,959,398.00
Deduct:			
Interest on U. S. Steel Corporation bonds outstanding	20,105,559.58	20,509,320.85	— 403,761.27
Premium paid on bonds redeemed, viz.:			
On subsidiary companies' bonds	118,104.19	119,032.43	— 928.24
On U. S. Steel Corporation bonds	717,228.49	814,418.93	— 97,190.44
Balance	$109,061,641.83	$ 76,600,363.88	+ $32,461,277.95
Add: Net balance of sundry charges and credits, including adjustments of various accounts	632,585.81	194,218.67	+ 438,367.14
	$109,694,227.64	$ 76,794,582.55	+ $32,899,645.09
Dividends on U. S. Steel Corporation stocks, viz.:			
Preferred, 7 per cent	25,219,677.00	25,219,677.00	.....
Common, 5 per cent	25,415,125.00	25,415,125.00	.....
Surplus net income	$ 59,059,425.64	$ 26,159,780.55	+ $32,899,645.09
Less, appropriated from surplus net income on account of expenditures made on authorized appropriations for additional property and construction	30,000,000.00	.....	+ 30,000,000.00
Balance carried to undivided surplus	$ 29,059,425.64	$ 26,159,780.55	+ $ 2,899,645.09

*Balance of earnings after making allowances for estimated amount of Federal income and excess profits taxes.

General Remarks

"The demand for iron and steel products during the first seven months of the year was large, the new business booked from month to month materially exceeding capacity. Beginning with August, there was a slackening in the volume of orders offering. The new business accepted during the year with the considerable tonnage of unfilled orders carried over from 1919 enabled the properties of the subsidiary companies to operate to very nearly full capacity except as operations were interfered with, especially from April to July inclusive, because of inadequate railroad service, arising principally from strikes and from shortage in fuel supplies. For the entire year the output of the steel plants, measured by the tonnage of finished products for sale, averaged 88.3 per cent of total rated capacity. During the four months from April to July, the output equalled only about 80 per cent of capacity. No change was made during the year in the domestic prices for the principal steel products which were in accordance with the schedule announced by the Industrial Board of the Department of Commerce on March 21, 1919, to which reference was made in last annual report. This price schedule was adhered to by the subsidiary companies notwithstanding the demand for steel was such during the first half of the year that higher prices could have been obtained. The price policy adhered to by the corporation, however, enabled it, notwithstanding substantial increased costs arising from advances in labor rates, in freight rates and higher costs for raw materials required to be purchased, especially fuel, to net considerable profits and to maintain operations at the degree above mentioned, also to carry forward to 1921 a large tonnage of unfilled orders. These latter at Dec. 31, 1920, totaled 8,148,122 tons of various classes of steel products in comparison with a total of 8,265,366 at the close of 1919. The unfilled tonnage at Dec. 31, 1920, has since been reduced to 6,933,867 tons at March 1, 1921.

Production

"The working capital required by the subsidiary companies in the form of inventories of raw materials and operating supplies shows an increased lock-up at Dec. 31, 1920, compared with the total at close of the preceding year amounting to $36,566,819. This increase is attributable in part to increased stocks on hand, operations at the close of 1920 having been conducted on a broader scale than a year ago, and in part to increased cost of raw and semi-finished materials produced by the subsidiaries. Inventory items were valued at cost or market, whichever figure was lower, and in so doing an adjustment or write-down in values was made of $15,105,850, which was charged 1920 earnings. The total amount invested in inventories at close of the year was $353,363,497, but against this total there has been accumulated during the past five years a reserve

fund to cover a substantial part of the increased unit values at which inventory items are carried compared with such values at close of 1915. During 1920 an additional $5,000,000 was set aside from earnings and added to this fund which now amounts to $95,000,000 and which is available to absorb any sudden and violent diminution in inventory valuations.

"Owing to financial conditions which prevailed during the latter part of 1920, the subsidiaries were required to carry an increased amount of credits to customers, these receivables totaling $149,412,717 at Dec. 31, 1920, compared with $92,806,000 at the close of 1919. It is believed, however, that these credits are safe and will be fully realized in due course. A very considerable part is due from railroad companies and interests dependent upon them, which have been unable to receive currently guaranteed and other balances due them from the United States.

Production for Three Years

PRODUCTS	1920	1919	1918
IRON ORE MINED			
In the Lake Superior Region	*Tons*	*Tons*	*Tons*
Mesabi and Vermilion ranges	20,875,695	19,400,891	22,383,492
Gogebic, Menominee and Marquette ranges	3,587,937	3,585,259	3,426,883
In the Southern region			
Tennessee Coal, Iron & R. R. Co.'s mines	2,557,377	2,436,943	2,522,536
Total	27,021,009	25,423,093	28,332,939
	5,981,022	5,835,289	5,141,365
LIMESTONE QUARRIED—COAL MINED			
For use in the manufacture of coke	24,384,925	22,955,636	25,393,155
For steam, gas and all other purposes	6,443,409	5,937,487	6,354,980
Total	30,828,334	28,893,123	31,748,135
COKE MANUFACTURED			
In bee-hive ovens	6,125,032	5,933,056	9,962,403
In by-product ovens	10,083,079	9,530,593	7,795,233
Total	16,208,111	15,463,649	17,757,636
BLAST FURNACE PRODUCTION			
Pig iron	14,352,617	13,481,738	15,700,561
Spiegel, ferromanganese and ferrosilicon	180,029	155,766	240,393
Total	14,532,646	13,637,504	15,940,954
STEEL INGOT PRODUCTION			
Bessemer ingots	5,402,897	4,788,242	5,630,246
Open hearth ingots	13,875,063	12,412,131	13,954,247
Total	19,277,960	17,200,373	19,583,493
ROLLED AND OTHER FINISHED STEEL PRODUCTS FOR SALE			
Steel rails (heavy and light tee and girder)	1,490,616	1,361,358	1,471,508
Blooms, billets, slabs, sheet and tinplate bars	1,023,762	975,020	1,489,737
Plates	1,759,263	1,578,360	2,171,362
Heavy structural shapes	1,040,619	855,118	1,079,601
Merchant bars, hoops, skelp, light shapes, etc.	2,846,686	2,270,711	2,159,279
Tubing and pipe	1,429,691	1,192,582	1,190,594
Wire rods	254,968	161,053	209,350
Wire and wire products	1,757,141	1,438,439	1,445,567
Sheets (black and galvanized) and tinplates	1,610,531	1,381,515	1,356,119
Finished structural work	416,469	351,704	503,380
Angle splice bars and all other rail joints	235,913	188,707	145,305
Spikes, bolts, nuts and rivets	93,464	39,009	67,514
Axles	97,145	75,494	141,480
Steel car wheels	73,819	36,946	84,331
Sundry Steel and iron products	98,415	91,919	334,356
Total	14,228,502	11,997,935	13,849,483
MISCELLANEOUS PRODUCTS			
Zinc	63,077	45,949	41,715
Sulphate of Iron	40,291	35,197	42,321
Fertilizer-"Duplex basic phosphate"	14,683	24,450	12,022
Fertilizer-Sulphate of Ammonia	133,798	130,210	.....
Ammonia (as liquor)	5,393	2,313	.....
Benzol products	119,109	107,549	.....
	Bbls.	*Bbls.*	*Bbls.*
Universal Portland cement	11,960,000	9,112,000	7,287,000

Capital Expenditures

"The corporation and the subsidiary companies expended during the year the net sum of $102,956,133 for the acquisition of additional properties, extensions and construction, and net stripping and development expense at mines. This total expenditure is classified by property groups as follows:

For manufacturing properties	$ 37,677,329
For coal and coke properties	18,905,383
For iron and manganese ore properties, including net additional expenditures for mine stripping and development	10,599,249
For railroads and docks	7,990,887
For ocean steamers	22,853,631
For housing facilities for employees	5,448,140
For sundry properties, including natural gas lines	1,190,139
	$104,664,758
Less: Credit for write-off to depreciation and replacement funds	1,708,625
Balance of expenditures for the year	$102,956,133

"After a lengthy and careful investigation, the corporation in December purchased at a cost of $4,413,285 the Morra da Mina manganese ore property located on the Central Railway of Brazil, in the State of Minas Geraes, Brazil, South America, about 286 miles from Rio de Janeiro. This mine is a developed and operating property. In fact for the past few years a very considerable part of the manganese ore requirements of the subsidiaries has been obtained from this mine. Investigations show that the mine has a large tonnage of developed ore of high grade which can be produced at relatively low cost. The title has been taken in the name of and the property will be operated by the Companhia Meridional de Mineracao, a Brazilian corporation, all of the stock of which will be controlled by the Steel Corporation. It is expected the acquirement of this property will prove of great value to the subsidiary companies, assuring to them for many years the requisite supply of a basic raw material absolutely necessary for the manufacture of steel, and which prior to the world war was obtained almost entirely from India and the Russian Caucasus.

Inventories

	Dec. 31, 1920	Dec. 31, 1919
Ores—Iron, manganese and zinc	$ 79,430,633	$ 75,855,858
Limestone, fluxes and refractories	6,021,870	4,270,425
Coal, coke and other fuel	10,587,353	7,517,024
Pig iron, scrap, ferromanganese and spiegeleisen	19,544,070	31,010,340
Pig tin, lead, spelter, copper, nickel, aluminum and dross and skimmings	11,980,704	11,541,018
Rolls, molds, stools, annealing boxes, etc.	15,788,150	15,431,459
Ingots—steel	2,541,799	5,309,136
Blooms, billets, slabs, sheet and tinplate bars, etc.	20,542,256	23,404,675
Wire Rods	1,880,580	1,728,715
Skelp	2,391,445	2,155,834
Finished products	68,146,896	49,062,768
Manufacturing supplies, stores and sundry items not otherwise classified	57,807,450	51,600,101
Mining supplies and stores (for ore and coal properties)	9,914,547	9,145,370
Railroad supplies and stores	10,481,934*	2,606,301
Merchandise of supply companies	1,880,723	1,747,452
Material, labor and expense locked up in uncompleted bridge and structural work and ship construction and other contract work	$50,913,162	
Less bills rendered on account	41,412,104	
	9,501,058	3,981,504
Stocks abroad and on consignment	15,681,950	10,459,768
Material in transit	9,240,079	9,974,930
Total	$353,363,497	$316,796,678
Less, reserve for account of actual cost or market value of stocks in excess of unit prices therefor at Dec. 31, 1915	95,000,000	90,000,000
Balance	$258,363,497	$226,796,678

*Includes inventories of subsidiary railroads which were not included at Dec. 31, 1919 account of roads being then under Federal control.

Wage Increases

"On Feb. 1, 1920, an increase was made of about 10 per cent in the common labor rates paid employees by the subsidiary manufacturnig and iron mining companies, the rates for other classes of employees being advanced equitably. Later in the year, in August and September, the wage rates of the several classes of employees of the coal mining companies were advanced 15 per cent and upwards. The wage rates of employees of the railroad companies were also increased as of May 1 under the award of the Railway Labor Board by an average of about 20 per cent.

"Because of advances in wage rates at different

times during the year and affecting different groups of employees, the rate of $7 for average during the year of the salary or wage per employee per day does not fully indicate the average paid at the close of the year. For the month of October, a representative month, the average rate was $7.23 per day; for the month of December $7.19 per day.

"The employees of the corporation and the subsidiary companies were in January, 1921, offered the privilege of subscribing for shares of common stock of the United States Steel Corporation at the price of $81 per share, all other conditions and terms being substantially the same as those under which similar offerings have been made in previous years. The subscriptions received to date of writing this report have been the largest made under any offering, 81,722 employees having subscribed for an aggregate of 255,325 shares. These totals compare with 63,278 subscriptions received in the preceding year for a total of 161,201 shares. At Jan. 31, 1921, there were 55,449 employees, or members of employees' families, who were stockholders of record owning preferred and common shares of the corporation; there were also an additional 15,003 employees, not stockholders of record, but who were subscribers to common stock offered under the stock subscription plan who were paying for their subscriptions in installments. As usual there was made in 1920 the distribution to employees of special compensation under the plan adopted in 1903.

"During the year the trustees of the United States Steel and Carnegie Pension Fund disbursed in pensions to retired employees a total of $779,766. Pensions were granted during the year to 324 retiring employees and at the close of the year there were 2,969 names on the pension rolls. Since the inauguration of the plan in 1911, an aggregate disbursement for pensions has been made of $5,880,581.

"The expenditures by the Corporation and the subsidiary companies during the year for safety work was $1,420,456 compared with $1,143,534 in 1919. The number of serious and fatal accidents in 1920, per 100 employees, was 13.29 per cent less than in 1919, and 53.89 per cent less than in 1906. The entire time of 126 employees is devoted to safety work and in addition more than 7,000 employees are constantly serving on safety committees.

The disbursements made by the subsidiary companies during the year for Work Accidents (including accruals not yet actually payable under State compensation laws) was $5,634,263. Of this total 87.6 per cent was paid or is payable directly to injured employees or their families. To provide prompt and adequate treatment for employees in case of accidents the subsidiary companies have built and are maintaining 298 emergency stations and 25 base hospitals, with a staff of 263 surgeons and physicians whose entire time is given to company work, also 91 outside surgeons retained on salaries, and all without any charges to employees. There are also being conducted 62 stations for training employees in first aid and rescue work.

"Additional installations were made during the year in providing modern sanitary facilities throughout the plants, mines and departments, for the health and comfort of employees. The cost of sanitary work during the year, including additional installations, was $4,227,263. At the close of the year there were in and about the plants 1,696 comfort stations with adequate toilet facilities, including 20,340 washing faucets or basins, 3,389 showers and 133,315 lockers."

Employees and Payroll

The average number of employees in the service of all companies during the past seven years, and the total salaries and wages paid were as follows:

	Average Number Employees	Total Payroll	Average Annual Earnings per Employee
1914.....	179,353	$162,379,907	$ 905
1915.....	191,126	176,800,864	925
1916.....	252,688	263,385,502	1,042
1917.....	268,058	347,370,400	1,296
1918.....	268,710	452,663,524	1,685
1919.....	252,106	479,548,040	1,902
1920.....	267,345	581,556,925	2,175

A comparison of total number of employees and total payroll for calendar years 1919 and 1918 follows:

Employees of	1920 *Number*	1919 *Number*	1918 *Number*
Manufacturing properties	200,991	188,550	199,029
Coal and coke properties	25,889	24,595	28,378
Iron ore properties	11,517	12,425	12,619
Transportation properties	24,643	23,132	25,055
Miscellaneous properties	4,305	3,404	3,629
Total	267,345	252,106	268,710
Total salaries and wages paid	$581,556,925	$479,548,040	$452,663,524
Average salary or wage per employee per day			
All employees, exclusive of general administrative and selling force	$6.96	$6.12	$5.33
Total employees, including general administrative and selling force	$7.00	$6.17	$5.38

Foreign and Domestic Shipments

	1920 Tons	1919 Tons	Increase or Decrease Tons	Per Cent
Domestic Shipments				
Rolled steel and other finished products	12,453,243	10,310,729	2,142,514	20.8 Inc.
Pig iron, ingots, spiegel, ferromanganese and scrap	341,563	230,560	111,003	48.1 Inc.
Iron ore, coal and coke	1,212,811	1,767,504	554,693	31.4 Dec.
Sundry materials and by-products	175,735	167,044	8,691	5.2 Inc.
Total tons all kinds of materials, except cement	14,183,352	12,475,837	1,707,515	13.7 Inc.
Universal Portland cement (bbls.)	11,380,260	9,618,611	1,761,649	18.3 Inc.
Export Shipments				
Rolled steel and other finished products	1,645,464	1,932,454	286,990	14.9 Dec.
Pig iron, ingots and scrap	6,979	86,395	79,416	91.9 Dec.
Sundry materials and by-products	55,657	48,157	7,500	15.6 Inc.
Total tons all kinds of materials	1,708,100	2,067,006	358,906	17.4 Dec.
Aggregate tonnage of rolled steel and other finished products shipped to both domestic and export trade	14,098,707	12,243,183	1,855,524	15.2 Inc.

Total value of business (covering all of above shipments, including cement and completed steamships delivered and other business not measured by the ton unit):	1920	1919	Increase or Decrease Amount	Per Cent
Domestic (not including inter-company sales)	$1,071,739,500	$909,081,769	$162,657,731	17.9 Inc.
Export	147,905,404	165,167,876	17,262,472	10.5 Dec.
Total	$1,219,644,904	$1,074,249,645	$145,395,259	13.5 Inc.

Volume of Business

The volume of business done by all companies during the year, as represented by their combined gross sales and earnings, equaled the sum of $1,755,477,025, as compared with a total of $1,448,557,835 in the preceding year.

This amount represents the aggregate gross value of the commercial transactions conducted by the several subsidiary companies, and includes sales made between the subsidiary companies and the gross receipts of the transportation companies (excluding those of railroads while operated under Federal control) for services rendered both to subsidiary companies and to the public.

The earnings for the year resulting from the above gross business represent the combined profits accruing to the several corporate interests on the respective sales and services rendered, each of which is in itself a complete commercial transaction.

IRON AND INDUSTRIAL STOCKS

Easier Money Rates Have Been Reflected in Market for Securities

Call money rates, running true to predictions made some time ago by banks, are easier and this fact was reflected in prices for most kinds of securities the past week. The recovery in securities, however, was based more on buying by professional stock exchange traders than on any increase in public investing, yet naturally is reflected in prices for those iron and industrial stocks which are bought and sold over the counter. Quotations for out-and-out steel stocks have continued to move within a narrow range, while those for other special issues have fluctuated widely, which substantiates the assertion that price movements the past week were based on technical market rather than fundamental industrial conditions.

There has been, it is true, some reinvestment by people who sold securities earlier in the year or during the latter part of 1920, based on the increase in car loadings and the ability of some of the railroads to float small bond issues to care for maturing obligations. The general public, however, lacks the confidence which characterizes strong markets for securities, it feeling there is still much in the general labor, railroad and industrial situations, to say nothing of the foreign credit and political questions, remaining to be settled. Improvements noted in some industries are offset by setbacks in others, and naturally prices for stocks in general do not go up or down very much because of the conflicting influences.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com.	34⅜- 37	Int. Har. com...	94 - 98¼
Allis-Chalm. pf..	79½- 82	Lackawanna Stl.	49⅝- 53½
Am. Can com....	26½- 29⅞	Midvale Steel....	29¾- 30¾
Am. Can pf.....	84 - 85¼	Nat. Acme	21¼- 23
Am. C. & F. com.	121 -123⅞	Nat. E. & S. com.	55¾- 60
Am. C. & F. pf...	111 -112½	Nat. E. & S. pf..	92 - 92¼
Am. Loco. com..	82¾- 87	N. Y. Air Brake.	76¼- 78¼
Am. Loco. pf....	— -105	Nova Scotia Stl.	— - 33
Am. Radtr. com.	70¼- 70½	Press. Stl. com..	83½- 87½
Am. Stl. F. com..	29¾- 30¼	Ry. Stl. Spg. com.	89 - 89¾
Am. Stl. F. pf...	— - 85½	Replogle Steel...	23 - 24¼
Bald. Loco. com.	82¼- 88⅞	Rpublic Stl. com.	62¾- 68¼
Bald. Loco. pf...	97 - 98	Sloss com	41½- 42
Beth. Stel com...	— - 52½	Superior Stl.....	38 - 41
Beth. Stl. Cl. B..	55 - 57⅜	Transue-Will. ...	37⅛- 41½
Beth. Stl. 8% pf.	103¾-105	Un. Alloy Stl....	31⅞- 32½
Chic. Pneu. Tool.	60 - 62¾	U. S. Pipe com..	14⅞- 18½
Colo. Fuel	26¼- 27	U. S. Pipe pf....	46 - 46⅞
Cru. Steel com..	81¼- 91½	U. S. Stl. com...	77¾- 81¾
Cru. Steel pf....	— - 88	U. S. Stl. pf.....	107⅝-110
Gen. Electric ...	128¾-138½	Vanadium St....	26 - 31½
Gt. No. Ore cert.	30 - 32	Westingh. Elec..	45¾- 48⅛
Gulf States Stel.	28¼- 30¼		

Big Increase in Earnings by the Virginia Company

The gross earnings of the Virginia Iron, Coal & Coke Co. last year were more than $6,000,000 greater than those for 1919, and approximately $3,000,000 greater than for 1918. It was therefore able, by adopting a more conservative dividend policy due to the downward turn in the pig iron market during the latter part of the year, to strengthen its financial affairs and wind up 1920 with a surplus of nearly $2,000,000, contrasted with one of $530,319 in 1919, and $475,775 for the year before. The 1920 income account compares as follows:

	1920	1919	1918
Gross earnings	$16,346,588	$10,271,985	$13,083,072
Net	2,920,062	1,490,018	1,835,593
Interest, Federal tax, etc.	780,009	414,689	815,402
Surplus	2,140,053	1,075,329	1,020,191
Dividends	272,184	544,416	544,416
Surplus	1,867,869	530,319	475,775

The company produced 169,140 tons of pig iron and shipped 166,928 tons. Production reached the peak in June with 16,622 tons. At the year's close there was 5486 tons in furnace yards. The company made 353,802 tons of coke, out of which 280,126 tons was consumed in the company's furnaces in making iron and 73,676 tons was shipped to the trade.

Dividend Reduced

The Trumbull Steel Co., Warren, Ohio, reduced its dividend on common stock for the first quarter, payable April 1, to 40 cents. The company paid a regular dividend of 50c. and extra of 12½c. the previous quarter. The regular preferred dividend of $1.75 was authorized, as well as the regular preferred of the Liberty Steel Co., a subsidiary. As a consequence of the reduction in common stock dividends by the Brier Hill Steel Co. and the Youngstown Sheet & Tube Co., both of Youngstown, Ohio, dividend distributions by the three companies will be $667,000 less for the initial quarter of 1921 than for the last quarter of 1920.

Gulf States Steel Co. Earnings

The 1920 earnings statement of the Gulf States Steel Co. was a much more favorable one than was issued for 1919. The gross profits of the corporation last year were $1,153,089, or $508,028 larger than the 1919. There was charged off $401,869 for depreciation, federal taxes and other charges, or $36,229 more than for the same purposes in the previous year, thereby leaving a net profit of $751,220, an increase of $471,799. By eliminating common stock dividends there was a surplus of $606,174, whereas in 1919, $111,136 was paid on the common shares, leaving a surplus of but $23,143.

The balance sheet as of Dec. 31, last, shows current assets of $2,547,809, as against current liabilities of $1,564,182, leaving a net working capital of $983,627. At the close of 1919, the current assets were $1,764,010, and the current liabilities $1,134,106, leaving a net working capital of $629,904.

The 1920 output of the company, in gross tons, compares as follows:

	1920	1919	1918
Coal*	297,863	296,490	307,672
Coke *	167,938	134,090	168,061
Limestone	20,115	24,908	14,543
Ore	5,611	.....	.....
Pig iron	70,363	59,149	72,341
Steel ingots	156,277	135,371	167,930
Billets and slabs.....	134,220	120,276	143,068
Wire rods	71,399	68,185	67,538
Bars*	31,635	18,045	24,676
Tie plates*	.....	.....	1,562
Wire*	113,822	113,009	113,231
Wire products*	69,393	67,662	62,083

*Net tons.

The company last year employed an average of 2266 men, the average earning per man being $1,854.73, whereas in 1919 the average number of men employed was 1973, and the average wage received $1,644.35.

Earnings of Various Companies

The Yale & Towne Mfg. Co. earned $46.50 a share on its $4,996,909 capital stock last year, the net profits after all charges and taxes amounting to $2,324,470. In the previous year the net profits were $2,363,094, or $47.29 a share.

With gross earnings of $18,042,247, contrasted with $25,006,047 for 1919, the Winchester Co., New Haven, Conn., last year, without making allowances for tax reserves and other deductions, was able to show a net income of but $1,048,683 last year. In 1919, $1,200,000 was set aside for taxes and $914,335 for other deductions, leaving a net income of $2,089,688.

After providing for depreciation, accrued renewals and federal taxes, the 1920 report of the Chicago Pneumatic Tool Co. shows gross earnings of $4,869,093, contrasted with $2,271,215 and $1,675,059, respectively, for the two previous years. Deducting interest on borrowed money, bonds, etc., provisions for loss on exchange rates, the sinking fund and other losses, the company last year carried a balance to its surplus of $1,073,900, which is equal to $8.33 a share on the $12,897,600 outstanding capital stock. In 1919, the balance to surplus was equal to $7.58 a share on the capitalization and in 1918, $8.26 a share.

U. S. Cast Iron Pipe Earnings

Earnings of the United States Cast Iron Pipe & Foundry Co. for 1920 were $851,592.53, as compared with a deficit of $503,703.28 for the preceding year, according to the annual report just made public by L. R. Lemoine, president. It is reported that the close of 1920 found the financial condition of the company satisfactory. The accumulation of unsold stock at high levels was avoided and the earnings for the year partly accrued through sales from the conservatively valued inventory.

With reference to prospects for the cast iron pipe industry the report says:

"In dull times public works are often rightly undertaken. Through them municipalities are now seeking ways of lessening unemployment. Heretofore, this has meant an increasing demand for pipe. In some directions the outlook is already brighter. Inquiries are evidencing activity. In so far as a forecast may now be properly ventured, it would seem probable that the business in 1921 will prove fairly satisfactory. At least, the new Administration at Washington bespeaks confidence. At the same time we should remind ourselves no one can tell just how long this period of readjustment will last."

Crucible Steel Co. of America, regular quarterly of 2 per cent on the common stock, payable April 30, to stockholders of record April 15.

Machinery Markets and News of the Works

BETTER TONE

Machinery Markets Show Improvement in Both Orders and Inquiries

Leading Milling Machine Makers Reduce Prices —Other Reductions

A better tone is in evidence in the machine-tool markets. While the actual number of orders being booked shows only a slight increase, there is less hesitancy on the part of buyers, and where prices on the machines desired have recently been reduced, there is less dickering over transactions. An instance of this is in milling machines.

Among the hopeful signs is the issuance of an inquiry for 30 machines by the General Electric Co., Schenectady, N. Y. This company dropped out of the market completely a few months ago, with considerable of its wants unsatisfied.

Some machines are being bought by the railroads. While no large railroad buying is expected until the financial and labor problems of the roads have been straightened out, the few purchases that have been made, though mostly of used equipment, have created a degree of encouragement. The Ann Arbor Railroad purchased several wood-working machines and is endeavoring to satisfy its metal-working machine requirements among used-tool offerings. The Rock Island has bought a few machines out of Government stocks. Small lists issued by the Big Four, Missouri, Kansas & Texas and the Monon may be closed soon.

The Duesenberg Automobile & Motor Co., which will move its plant in the East to Indianapolis, is in the market for a few machines to round out and the Midwest Engine Co., Indianapolis, is expected to come into the market soon for considerable equipment. The Carnegie Steel Co. was a purchaser of Cincinnati machines last week.

Cincinnati machine-tool builders report a slight improvement in orders, including some bookings for export to South America, South Africa and the Far East.

Cleveland reports a few signs of improvement. Among these is the release of three boring mills, which had been sold to a company specializing in tire molds. These machines had been held up, but following a reduction in price, the order was reinstated. Demand for wood-working machines, it is stated, has improved materially.

Reductions of about 15 per cent on Kearney & Trecker, Kempsmith and Hendey milling machines are reported. Cincinnati and Brown & Sharpe were reduced some weeks ago. The Canedy-Otto Mfg. Co. has reduced prices about 15 per cent on its line of radial and upright drills, forges, grinders, etc. The Champion Blower & Forge Co. has announced reductions approximating 10 per cent and the Royersford Foundry & Machine Co. has cut 10 per cent on its punching and shearing machines and sensitive drills. Reductions on some lines of lathes are also reported and a Western maker of vertical boring machines has reduced prices about 20 per cent.

New York

NEW YORK, March 22.

The most interesting development in the local machine-tool market in the past week was the inquiry of the General Electric Co., Schenectady, N. Y., for about 30 miscellaneous machines. At the time of the general slump in machine-tool buying last fall the General Electric Co. was in the market for a considerable number of machines for its various shops. Action on these inquiries was repeatedly deferred, and finally the trade learned that the company's purchasing departments had been instructed to postpone all machine-tool buying indefinitely. The new list comes as the first indication that the electrical interest may again be an important factor in the market. Requirements of several of its shops are said to be still unsatisfied. The list sent out last week includes the following machines:

One turret lathe, equivalent to Pratt & Whitney 1½ in.
One turret lathe, equivalent to Pratt & Whitney ⅝ in.
One screw machine, equivalent to Brown & Sharpe ⅝ in.
One flat-turret lathe, equivalent to Jones & Lamson 2 in.
One milling machine, equivalent to Van Norman No. 2.
One cam drawing press, equivalent to Bliss No. 1-B.
One knuckle joint embossing press, equivalent to Bliss No. 22.
One punch press, 2½-in. stroke, equivalent to Stiles No. 5.
Two inclinable punch presses, 2-in. stroke, equivalent to Bliss No. 19.
Four inclinable punch presses, two of 2-in. stroke and two of 2½-in. stroke, equivalent to Bliss No. 21.
One four-spindle sensitive drill, 15-in. overhang.
Two 24-in. upright drills, with lever feed.
One single-spindle sensitive drill, round-column type, equivalent to Avey.
One speed lathe, 12-in., equivalent to Blount.
Two universal shears for profiles and bars, equivalent to Niagara.
One vertical surface grinder, equivalent to Blanchard No. 16.
One bench lathe, 7 x 32 in.
One power hack saw.
Three shapers, one 30 in. and two 20 in.
Two wet tool grinders, 18-in. wheels.
Two tilting tumbling barrels, equivalent to 28-in. Henderson.

In actual orders some sales offices note a slight improvement. Milling machines are in fair demand, and one large company, which recently reduced its prices, has received a number of orders during the week directly traceable to the price cut. Grinding machines are also in fair demand, particularly machines for cylinder grinding, on which one company now quotes about 30 days' delivery. Several orders for punches and shears have been placed and others are in prospect. The Central Aguirre Co., sugar, Porto Rico, is in the market for a lathe and boring mill.

The crane market continues dull, with few inquiries and numerous orders pending. The new specifications for the M. W. Kellogg Co., Jersey City, N. J., call for only three cranes of 20-ton, 30-ton and 40-ton capacities and one bucket handling crane. The order will probably be placed this week. The Fulton Lumber & Terminal Co., 112 West Forty-fourth Street, New York, will probably be in the market soon for overhead traveling cranes and hoists through Andrews, Tower & Lavelle, consulting engineers, 224 Main Street, Springfield, Mass.

Among current inquiries is one from Jay H. Newbury, pipe fitting manufacturer, Goshen, N. Y., for a 5-ton overhead traveling crane for 42-in. gage track for export to Port Limon, Costa Rica; T. H. Henkels Co., Weightman Building, Philadelphia, a 35-ton to 40-ton locomotive crane with long boom for coal handling on a barge; American Radiator Co., Buffalo, N. Y., a second-hand locomotive crane, 20-ton capacity, 60-ft. boom with 1½-yd. clamshell bucket for shipment to Fernando, Fla.; Morris Fineberg, Old South Building, Boston, Mass., second-hand 15-ton locomotive crane equipped with magnet. The Gibney Iron & Steel Co., Phillipsburg, N. J., recently in the market for a steam locomotive crane, has changed the specifications to a 20-ton electric locomotive crane. The Bartlett Hayward Co., Baltimore, Md., and the Jamestown Malleable Products Corporation, Jamestown, N. Y., have withdrawn their inquiries for locomotive cranes, and the Treadwell Construction Co., Midland, Pa., and Sampson & Reuter, 221 Catherine Street, Elizabeth, N. J., have purchased and rented cranes. The White Fuel Oil Engineering Corporation, New York, has postponed its new foundry building indefinitely.

Among recent sales are: Bedford Foundry & Machine Co., a 15-ton, 52-ft. span overhead traveling crane to James Gillies & Sons, Long Island City, N. Y., and the Shepard Electric Crane & Hoist Co., a 6-ton monorail hoist to the Pittsburgh Rubber Mills, Pittsburgh, Cal.

THE IRON AGE has an inquiry from a subscriber for a machine suitable for boring a 2½-in. hole in a brass sleeve 27 in. long, cast on a taper core 2 5/16 in. diameter at one end and 2 in. at the other end. The material of which this sleeve is made contains no lead and so is not free cutting. The hole must be kept absolutely smooth and free from tool or chatter marks of any kind. Required production is 500 pieces per day. Address Machinery Editor, THE IRON AGE.

The Schildwachter Auto Co., 1887 Park Avenue, New York, manufacturer of automobile bodies, is taking bids for a new two-story, reinforced-concrete plant, 100 x 120 ft., at Long Island City.

The Montauk Bronze Co., Brooklyn, has been incorporated with a capital of $30,000 by A. J. Monten, C. Green and J. C. Zimmerli, 563 Hancock Street, to manufacture bronze and brass products.

The Miller Safety Guard Corporation, New York, has been incorporated with a capital of $100,000 by H., M. and N. Miller, 29 West Thirtieth Street, to manufacture machine guards and other metal specialties.

The Auto Water Heater Corporation, New York, has been incorporated with a capital of $200,000 by W. H. and E. C. Hawley and J. R. Delafield, 17 East Seventy-ninth Street, to manufacture automobile heater appliances and other kindred equipment.

The Modern Iron Works, 585 First Avenue, New York, has filed notice of dissolution under State laws.

The Accounting Machine Development Corporation, New York, has been incorporated with a capital of $100,000 by E. J. Parker, D. Connor and J. J. Harris, 430 East Fifty-seventh Street, to manufacture tabulating machinery and parts.

The Shamrock Towing Co., 667 West Fiftieth Street, New York, is having plans prepared for a two-story automobile service works, repair shop and garage, 35 x 100 ft., at 661 West Fiftieth Street, to cost about $75,000. W. J. Conway, 400 Union Street, Brooklyn, is architect.

Brown-Spin-Wright, Inc., New York, has been incorporated with an active capital of $30,000 by Alexander C. Proudfit, F. W. Goodhue and A. W. Fiedler, 120 Broadway, to manufacture textile machinery and parts.

The Promin Engineering Corporation, New York, organized to manufacture carburetors and ignition equipment for automobile service, has purchased the building at Park Avenue and 166th Street, 50 x 100 ft., now in course of construction, for its new works. John A. Pateracki, Tremont and Arthur Avenues, formerly assistant district attorney of Bronx County, is president of the company.

The White Fuel Engineering Co., 742 East Twelfth Street, New York, is taking bids for its two-story foundry addition, 100 x 103 ft., estimated to cost about $75,000.

L. H. Jaccard, Inc., New York, operating a machine and automobile repair plant at 145 West Fifty-fourth Street, has filed notice of change of name to the Gotham Auto Body Co., to specialize in the manufacture of automobile bodies.

John B. Astell & Co., Inc., New York, has been incorporated with a capital of $50,000 by John B. Astell, R. J. Sheridan and W. G. Miller, Jr., 128 William Street, to manufacture foundry equipment and supplies.

The Hunts Point Iron Works, New York, has been organized by L. Kopelson and E. Lippert, 2555 Third Avenue, Bronx, to manufacture iron products and operate a general iron and metal-working plant.

The American Gas & Electric Co., 30 Church Street, New York, is preparing plans in its engineering department for an addition to the electric generating plant of the Atlantic City Electric Co., Atlantic City, N. J., a subsidiary organization, to cost about $800,000 with machinery.

W. N. Kenney and C. J. Lakeman, 416 East Eighty-fourth Street, Brooklyn, have organized the Kenney & Lakeman Co., to manufacture cutting and grinding machinery and parts.

William A. Hall's Son, Inc., New York, has been incorporated with a capital of $100,000 by W. J. Walter, W. C. Law and T. E. Hall, 111 Broad Street, to manufacture anchors, chains and other heavy metal products.

The Burley Welding Works, 20-22 Kosciusko Street, near Bedford Avenue, Brooklyn, manufacturer of welding apparatus, welded equipment, etc., has filed plans for a three-story brick addition, 40 x 100 ft., to cost about $20,000.

As a site for the construction of a new electric plant and service building, the Queens Borough Gas & Electric Co., 347 Central Avenue, Far Rockaway, L. I., has acquired property at Edgemere, comprising the block front, 250 ft., at Beach Fifty-third Street and the Boulevard.

The Bay Twenty-third Street Construction Co., Brooklyn, has made application to the city for permission to build a new machine works and automobile repair shop at 8805-17 Eighteenth Avenue, extending through to 198-208 Bay Nineteenth Street. Charles M. Straub, 147 Fourth Avenue, New York, is architect.

The Paramount Lighting Fixtures Corporation, New York, has been incorporated with a capital of $30,000 by H. A. Safion, M. Geringer and J. J. Gans, 302 Broadway, to manufacture metallic electric and gas fixtures.

Charles O'Malley, Brooklyn, has acquired at a receiver's sale the lease of the plant and machinery of the Phono-Motor Mfg. Co., 321-25 Dean Street, for $56,300. The lease carries an option to purchase the land and building for $32,500. The purchaser also secured property in the rear of the plant at 508 Pacific Street for $8,600, and proposes to operate a similar factory, to include the entire acquisition.

The Theodore A. Crane's Son Co., Brooklyn, operating a shipbuilding plant at the foot of Columbia Street, will install a new electrically operated drydock at its works, and proposes to have the addition ready for service in the fall. The new dock will accommodate vessels up to 500 ft. in length, with gross tonnage of 11,000 tons. It will be built in four sections. The pumping installation will consist of centrifugal units, motor-driven.

Durant Motors, Inc., William C. Durant, 1764 Broadway, New York, president, recently organized with a capital of $5,000,000 to manufacture automobiles, is planning for the construction of a new experimental plant at Long Island City.

The Machinery Utilities Co., Inc., 501 Fifth Avenue, New York, has filed notice of dissolution under State laws.

The Giles Engineering Co., Grand Central Palace, New York, is taking bids for a four-story metal-working plant at Flushing, L. I., 60 x 135 ft., brick and steel.

The Terminal Plating Works, Inc., Brooklyn, has been incorporated with a capital of $30,000 by W. J., C. A. and E. A. Cook, 561 Eighty-fourth Street, to manufacture plated metal ware.

The Northwestern Electric Equipment Co., 35 Vestry Street, New York, has leased the five-story building at 379-381 Washington Street, 60 x 60 ft., for new works.

The A. M. Co., Brooklyn, has been incorporated with a capital of $45,000 by W. H. Black, L. Hill and S. I. Muller, 196 Monitor Street, to manufacture airplanes and airplane motors.

The New Brunswick Cornice Works, 8 Jelin Street, New Brunswick, N. J., has completed plans for a three-story addition, 25 x 75 ft., to cost $30,000. Alexander Merchant, 363 George Street, is architect.

The Direct Rubber Co., 46 Paterson Street, New Brunswick, N. J., has been incorporated with a capital of $500,000 by Samuel C. Clark, John J. Moriarty and Willett S. Chinery to manufacture automobile tires and other rubber products.

Fire, March 17, destroyed the machine shop of W. E. Slater & Son, North Bridge Street, Somerville, N. J., farm machinery and parts, with loss estimated at about $15,000.

F. William Stocker, 501 Eighth Street, Hoboken, N. J., manufacturer of engineering specialties, is having plans prepared for a new two-story plant on Eighth Street, 75 x 100 ft., to cost about $50,000. Leo Feinen, 3697 Boulevard, Jersey City, N. J., is architect.

John J. Marnell, 77 River Street, Hoboken, N. J., and Edward D. Grosso have organized the Power & Chemical

Equipment Co., to manufacture brass and bronze specialties and other metal products.

The M. W. Kellogg Co., 117 Westside Avenue, Jersey City, N. J., manufacturer of welded steel pipe, fittings, power plant equipment, etc., has filed plans for the erection of three buildings on Hackensack Avenue, in the vicinity of its present works, consisting of a one-story welding shop to cost $73,500, one-story construction and metal-working shop, $43,750, and one-story plate shop to cost $47,250. The new structures will form part of the proposed pipe works of the company, estimated to cost close to $3,000,000. The plant will increase the present capacity of steel welded pipe about six-fold and will be equipped to handle heavy plate pipe construction. It will occupy a large portion of a 42-acre tract with initial buildings to aggregate about 250,000 sq. ft. of space. A number of electric traveling cranes will be installed.

The Board of Water Commissioners, Perth Amboy, N. J., has approved plans for the erection of a new machine and repair shop for the Water Department on King Street, and has authorized an immediate call for bids. Samuel J. Mason is superintendent of the department.

The Epic Co., Inc., Newark, N. J., has leased the two-story and basement factory at 50 Spring Street, which it will equip for the manufacture of calculating machines and parts.

The Modern Steel Wheel Corporation of New Jersey, Newark, has been incorporated with a capital of $125,000 by Edward H. Roberts, Christian Kuyl and Frank C. Kusterer, 20 Komorn Street, to manufacture automobile and other steel wheels.

The Bretscher Mfg. Co., 72 Marshall Street, Newark, manufacturer of automobile tail-light devices and other metal products for motor cars, has leased property at 29 Congress Street for a branch plant. The present works will also be maintained.

Fire, March 10, destroyed a portion of the plant of the Franklin Baker Oil Co., Doremus Avenue, Newark, with loss estimated at about $100,000. George Cloud is manager.

Barrasso & Blasi, Inc., 112 Arlington Street, Newark, manufacturing jeweler, has awarded a contract to Enstice Brothers, 40 Clinton Street, for a new two-story and basement plant, 56 x 80 ft., at Governor Street and Marion Place, to cost about $35,000. Precision machinery and other equipment will be installed.

The plant of the New Toy Co., 219-25 Central Avenue, Newark, will be sold by the receivers, Chester W. Fairlie and Frederick L. Draine. It consists of a two-story brick and reinforced-concrete building, with total floor area of 54,000 sq. ft. and land area of 37,000 sq. ft.

The New York Auto Top & Supply Co., 260 Halsey Street, Newark, has filed plans for new works at Broad and Astor streets to cost about $30,000.

The Bander Date & Numbering Machine Co., 41 Oraton Street, Newark, has filed notice of organization to operate a plant for the manufacture of calculating machine parts and general repairs. William B. Allan, 260 Chadwick Avenue, heads the company.

Bender & Sons, Newark, have awarded a contract to Joseph Heller, 94 Huntington Street, for a one-story machine shop, 50 x 122 ft., at Emmet Street and New Jersey Railroad Avenue, 83 x 170 ft., to cost about $20,000. Martin Bender, 14 South Hillside Avenue, Glen Ridge, N. J., is president.

The Blackman Machine Works, 12 South Spring Street, Elizabeth, N. J., is taking bids for a one-story addition, 35 x 100 ft., on South Spring Street. J. Ben Beatty, 12 North Read Street, Elizabeth, is architect.

Philadelphia

PHILADELPHIA, March 21.

The Bureau of Water, Department of Public Works, Philadelphia, has plans under way for a one-story machine and repair works, 160 x 200 ft., at Clearfield and Twenty-eighth streets. C. E. Davis is director.

The Bronze Novelty Casting Corporation, Philadelphia, has been incorporated with a capital of $100,000 by E. O. Thomas, M. J. Robinson and H. L. Maris, Denckla Building, to manufacture bronze, brass and other metal castings.

A one-story power house, 51 x 70 ft., to cost about $25,000 will be erected at the tag manufacturing plant of the Reyburn Mfg. Co., Twenty-third and Allegheny streets.

The Commercial Truck Co., Twenty-seventh and Brown streets, Philadelphia, manufacturer of automobile trucks, electrical equipment, etc., opened its new plant at Rising Sun and Hunting Park avenues on March 19 and regular production has begun.

The Philadelphia Mechanical and Electrical School, 614 Brown Street, Philadelphia, has leased property at Broad and Spring Garden streets for new instruction shops.

The John E. Thropp Sons' Co., Lewis Street, Trenton, N. J., manufacturer of rubber mill machinery, has had plans prepared for a one-story forge shop on Fair Street estimated to cost about $25,000. J. Osborne Hunt, 114 North Montgomery Street, is architect.

The J. B. Nolan Co., Camden, N. J., has been incorporated with a capital of $125,000 by John B. Nolan, Maxwell F. Gilbert, Clifford A. Baldwin and Albert E. Burling, 520 Market Street, to manufacture heating and cooking devices and equipment.

B. S. Muir, Collingswood, N. J., has awarded a contract to Thomas H. Miller, 3719 Westfield Avenue, Camden, N. J., for a new machine shop and repair works, 30 x 60 ft., at 2008-12 Federal Street, Camden.

Fire, March 13, destroyed the electric power plant at the Coalbrook Colliery of the Hudson Coal Co., Union National Bank Building, Scranton, Pa., with loss estimated at $80,000. It will be rebuilt.

The Delaware, Lackawanna & Western Railroad, coal mining department, Scranton, Pa., has awarded contract to John Curtis & Co., 1 Hickory Street, for a one-story machine and forge shop, 83 x 92 ft., at its Pettebone Colliery, to cost about $30,000.

The York Mfg. Co., York, Pa., manufacturer of ice-making and refrigerating machinery, has commenced the dismantling of the plant of the York Brewing Co., recently acquired. It will be remodeled and equipped for machinery production.

The Hershey Traction Co., Hershey, Pa., has completed plans for a new power house on Conewago Creek, near Elizabethtown, Pa., for general traction service.

The Bell Locomotive Works, Bloomsburg, Pa., is being reorganized by a committee of creditors of the company, which has secured a majority control. Under new management the plant will be reopened and production started at an early date.

Machine shop, metal-working, foundry and other mechanical equipment will be installed in the manual training shops to be constructed in connection with a new high school at Pottstown, Pa., estimated to cost about $500,000. The Board of Education is in charge. John T. Simpson, 31 Clinton Street, Newark, N. J., is architect.

The Heagy & Alberts Co., Middletown, Pa., has plans under way for a new two-story brick and steel automobile service and repair works, 110 x 120 ft., in the Eagle Heights section, to cost about $75,000.

New England

BOSTON, March 21.

Reductions are announced on some leading lines of lathes. A well known New England maker has cut prices 10 per cent, a Middle West manufacturer has made a similar reduction, while two sizes of a Pennsylvania made lathe are lower, three others higher and the two remaining sizes unchanged. Some manufacturers of milling machines are quoting 10 to 15 per cent less than in January. The past week a Connecticut maker reduced prices approximately 20 per cent, and a Western producer of both metal and wood millers, 10 per cent. The latter also made a corresponding cut in boring machines. A Western manufacturer of vertical boring machines has lowered quotations 20 per cent, but is guaranteeing prices against a further decline until September. One line of upright drills has been reduced 10 per cent. Manufacturers of other machine tools have materially lowered prices, in some cases at the request of local representatives in the hope of securing business. The downward trend of values the past week was more pronounced than at any previous time this year. Little prospective business has materialized in orders. This is true regarding new as well as used machinery. The decline in demand for used machinery undoubtedly is due in a large measure to the public auction sale of the equipment of the Bristol Machine Tool Co., Bristol, Conn.

The Wettamore Mills, Fall River, Mass., textiles, which is closed, is in the market for a used 20-in. or 24-in. lathe, and the Manchester Machine Works, Manchester, N. H., for a used 10 x 36-in. plain Norton grinder. The International Paper Box Machine Co., Nashua, N. H., has purchased a 36-in. x 12-ft. back geared used engine lathe for $850. A local dealer this week sold two fairly large presses, one to a Boston and the other to a New Hampshire concern.

Prospective orders for about 40 grinding machines, reported last week, have not yet been placed. The American Metal Parts Corporation, Boston, is inquiring on a fairly large list, including eight lathes, but appears in no hurry to close. The Manomet Mills, New Bedford, Mass., textiles,

which recently purchased some equipment, will, it is understood, be in the market for a number of machine tools in the next few weeks for its new No. 4 mill. The Taylor Mfg. Co., Cambridge, Mass., has bought a Sanford centerless grinding machine for piston ring production. A western Massachusetts city is expected to close on six 18-in. lathes within the next fortnight. Numerous garages have purchased small South Bend lathes and a Norwood, Mass., shop is in the market for a 32-in. x 12-ft. double-geared engine lathe. Some textile mills are inquiring on single, two and three tools, but as appropriations have generally been limited, buyers are doing considerable shopping.

A greater Boston chemical concern is about to close on $20,000 to $30,000 worth of material handling equipment. A New England mill which last year inquired on a large crane this week again asked for bids on the same equipment. Drastic price cuts were made, as compared with the original bids, but the company has decided to hold off for still lower prices. A Western manufacturer of portable shop cranes has reduced prices 10 per cent.

A good demand is noted for small tools and in many instances more attention is being given to this department than to machinery.

Drills, grinders, lathes, milling machines, presses, profilers, slotting machines, turret lathes, screw machines, and a large assortment of miscellaneous equipment were sold at public auction at the plant of the J. Stevens Arms Co., Chicopee Falls, Mass., March 18.

The Gem Auto Truck Co., Troy, N. Y., light trucks and automobile truck parts, has purchased the Swanton, Vt., plant of the Remington Arms Co., Inc., which it will occupy within the near future.

The W. B. U. Tool Co., 104 Harding Street, Worcester, Mass., is putting on the market a new universal vise and drilling jig for holding work on a drill press grinder, shaper, milling machine, etc.

The Builders' Iron Foundry, Providence, R. I., has awarded contract for a machine shop on Kinsley and Sims avenues. Work is expected to start in the spring.

The Smith-Springfield Body Co., West Springfield, Mass., automobile bodies, will soon start the construction of its second unit, 90 x 320 ft., monitor type, which will double the present capacity.

The Beacon Tool & Machine Co., Boston, Richard S. Snow, 36 William Street, Cambridge, Mass., president, and Thomas F. Gooley, 16 Tapley Street, Lynn, treasurer, has incorporated under Massachusetts laws with a capital of $10,000.

William Edward Fennell and J. Comer Jones, 7 Merchants Row, are president and treasurer respectively, and Wilhelmine Jones, 21 Winchester Street, Brookline, vice-president, of the J. Comer Jones Power & Pump Co., Boston, which recently took out a Massachusetts charter. It has a capital of $20,000.

The Page-Lewis Co., Chicopee, has taken out a Massachusetts charter to manufacture firearms in part of the plant formerly occupied by the Stevens-Duryea Co., Chicopee Falls, automobiles. Irving H. Page is president; George S. Lewis, vice-president, and Charles H. Leonard, treasurer.

Work will soon start on two small additions to the plant of the D. J. Long Machine Co., Salem, Mass.

The Keyes Fibre Co., Waterville, Me., will build a new one-story boiler and machine room, 90 x 140 ft., a one-story pulp room, 40 x 150 ft., and a one-story drier room, 90 x 140 ft.

Benjamin Ticknor and W. H. Partridge, formerly with Olds & Whipple, Hartford, Conn., have formed a partnership under the name of Ticknor & Partridge, to do a general sheet metal business. They have leased two floors at 15½ Wells Street and are installing machinery.

The Hortonia Power Co., Brandon, Vt., is planning to rebuild its power plant at Middlebury, Vt., recently destroyed by fire with loss estimated at $40,000.

The B. & B. Wire Co., 806 Eddy Street, Providence, R. I., has filed notice of organization to manufacture wire goods. Harry A. Beane, 14 Bogman Street, heads the company.

The Boston & Lawrence Bolt Co., Boston, has filed notice of organization to manufacture bolts, nuts, etc. John J. Lennon, 68 Devonshire Street, heads the company.

The Monatiquot Rubber Works, South Braintree, near Boston, is having plans prepared by J. O. DeWolf & Co., 15 Bromfield Street, Boston, architects, for its new plant on Hancock Street, to replace that recently destroyed by fire. It is estimated to cost about $200,000 with machinery, instead of $100,000, as previously announced.

Bird & Son, Inc., Boston, manufacturer of roofing products, has arranged for a stock issue of $1,000,000. It is building a one-story addition to its plant at East Walpole, 45 x 200 ft.

The United Illuminating Co., 84 Temple Street, New Haven, Conn., has filed plans for a one-story addition to its steam power plant on Grand Avenue, 70 x 90 ft., to cost about $40,000.

The American Tube & Stamping Co., Bridgeport, Conn., has filed plans for a two-story brick building, 30 x 40 ft., on Stratford Avenue, to be used as an experimental and testing works.

The Worcester Gear Works, Inc., Worcester, Mass., has begun operations at its new plant in the Osgood Bradley Building, replacing its works recently destroyed by fire.

The Boston Damper Co., Boston, has filed notice of organization to manufacture dampers and other specialties. Clifford M. Tyler and Ernest L. Freeman, 26 North Washington Street, head the company.

Buffalo

BUFFALO, March 21.

The Dunlop Tire Co., River Road, Buffalo, is arranging for the opening of its new plant on April 15, with employment of about 1000 operatives. Increased production will be developed until a working force of about 7000 is employed. The plant, when entirely completed, with full machinery installation, will represent an investment of $22,000,000.

The Niagara Falls Power Co., Buffalo, is arranging for an increase in capital from $26,515,400 to $40,000,000, a large portion of the proceeds to be used for extensions in its hydro-electric power plants. The capacity will be increased from 300,000 to 400,000 hp.

A machine shop and other mechanical departments will be installed in the new Science Building to be erected by the board of directors of Canisius College, Main and Jefferson streets, Buffalo. The structure will be one of a group of new buildings, estimated to cost about $1,000,000. M. J. Ahern is president.

The Townley Lock Corporation, Elmira, N. Y., has been incorporated with a capital of $100,000 by C. J. Carroll, Elmira, and G. W. and J. D. Ryan, Corning, N. Y., to manufacture locks and locking devices.

The Coons-Mabbett Mfg. Co., 203 State Street, Rochester, N. Y., manufacturer of machinery and parts, has filed notice of reorganization with an active capital of $105,000 and preferred stock to the value of $100,000.

The DeLancey Electric Light Co., Delhi, N. Y., has made application to the Public Service Commission for permission to construct a new electric power plant at DeLancey. C. Stewart Hylers is president and William A. Salton, secretary.

The Acme Spring Oiler Corporation, Manlius, N. Y., has been incorporated with a capital of $150,000 by L. P. Standen and G. H. Cole, Manlius, to manufacture oiling devices and equipment.

Chicago

CHICAGO, March 21.

Buying is limited on the part of both railroads and industrials, but the latter are beginning to take an interest in equipment which will make for more economical production. Inquiries are somewhat more numerous, but this is accounted for in part by the desire of the prospective purchaser to shop around until he finds a bargain. Local dealers have received a number of inquiries from points as far distant as South Carolina. No new railroad lists have appeared. The passage of the Winslow bill has thus far failed to stimulate buying by the carriers. The only current purchase in this district is a small one made by the Rock Island, consisting of a 42-in. drill press and engine lathe bought from local dealers, and a 2-in. bolt cutter and 36-in. planer bought from Government stocks at Little Rock, Ark. The Illinois Central is expected to buy at least a few machines this week against its list of long standing. The Great Northern Railway Co., St. Paul, Minn., F. A. Bushnell, purchasing agent, is inquiring for one 1-in. fast speed belt-driven double-head bolt cutter with Landis die head. Manufacturers quoting are asked to give shipping weight and freight rates to St. Paul.

A few more price changes have been made. The Rockford Milling Machine Co., Rockford, Ill., has reduced prices about 11 per cent. The Canedy-Otto Mfg. Co., Chicago Heights, Ill., has marked down its entire line of radial drills, upright drills, forges, grinders, etc., about 15 per cent. The Champion Blower & Forge Co., Lancaster, Pa., manufacturer of forges, power hammers, vertical drilling machines, etc., has announced a 10 per cent reduction. The Royersford Foundry & Machine Co., Philadelphia, has made a similar change in the prices of its products, including punching and shearing machinery and sensitive drilling machines.

The Chicago Blow Pipe Co., 216 North Sacramento Avenue, Chicago, has let contract for a one-story plant, 73 x 76

ft., at Clarkson Street, near West Lake Street, to cost $25,000.

The Runzel-Lenz Electric Mfg. Co., 1751-55 North Washtenaw Avenue, Chicago, has let contract for a two-story addition, 50 x 60 ft., to cost $20,000.

The J. F. Schuler Co., sheet iron works, 2428 North Ashland Avenue, Chicago, is receiving bids on remodeling and two-story additions to its plant, 24 x 28 and 25 x 30 ft., to cost $10,000.

The Staver Motor Car Co., automobile repair shop, 100 West Garfield Boulevard, Chicago, has let contracts for a two-story automobile service and office building, 141 x 171 ft., at State and Fifty-fifth streets, to cost $150,000.

The Floyd Mfg. Co., 522 South Clinton Street, Chicago, has let contract for a two-story factory, 56 x 239 ft., for the manufacture of safety razor sharpeners, at 2800-2830 North Harding Avenue.

Irving J. and Raymond Jensik, 2641 Milwaukee Avenue, Chicago, have let contract for a one-story automobile service station, 50 x 125 ft., at 2631-33 Milwaukee Avenue, to cost $21,500.

The Yeager-Bennett Co., which engages in general automobile reconstruction work at 1238 South Michigan Avenue, Chicago, has let a contract for a two-story plant, 67 x 180 ft., at 2633-37 Indiana Avenue.

The Victory Mfg. Co., 2617 Diversey Boulevard, Chicago, has been incorporated with $40,000 capital stock by G. Austin Hinkley, Arthur M. Stenberg and Victor F. Wenzl, to manufacture razors, brushes, and miscellaneous hardware.

The Cowles Marine Salvage & Mfg. Co., 532 South Green Street, Chicago, has been incorporated with $250,000 capital stock by John T. Cowles, Marion E. Harwich, and James D. Davidson, to manufacture machinery to raise and salvage sunken ships.

A. B. Kitselman & Co. have opened a new plant at 1129-1131 West Washington Street, East Peoria, Ill., for the manufacture of wood and metal patterns, tools, dies, jigs and fixtures.

The North American Car Co., 328 South La Salle Street, Chicago, is having plans prepared by H. G. Tregillus, 5 North La Salle Street, for a one-story car shop at 135th Street and California Avenue, Blue Island, Ill., to cost $50,000.

The Duplex Boiler Co., Inc., 30 North La Salle Street, Chicago, has been organized with $25,000 capital stock to manufacture duplex water tube boilers of the two-drum type, ranging in size from 100 to 1000 hp. It has arranged with James Heggie & Son, Joliet, Ill., to build the boilers under contract. The officers are T. H. Burton, president, and R. L. Baker, secretary-treasurer.

The Dexter-Reynolds Mfg. Co., 130 North Wells Street, Chicago, has been incorporated with $25,000 capital stock to manufacture a new type of washing machine and a patent clothes scrubber. The officers include C. H. Reynolds, president; L. M. Kerrigan, secretary; and A. L. Dexter, treasurer.

The Seminole Mfg. Co., with temporary headquarters at 3424 Ivy Street, Indiana Harbor, Ind., has been incorporated by L. W. Saric, M. D. Heiny, and others, to manufacture wheelbarrows, milk cans, water heaters, etc. A new plant will be erected this summer.

The Edward Valve & Mfg. Co., 145th Street, East Chicago, Ind., is completing plans for the reconstruction of that portion of its works recently destroyed by fire. It will cost $350,000.

The plant of the Eclipse Automatic Co., manufacturer of farm implements, awning supports, etc., Conkey and Blaine streets, Hammond, Ind., is completed and equipment will soon be installed. The officers include D. A. Johnson, president; A. C. Berry, vice-president; L. W. Brown, treasurer, and M. Turberwill, secretary.

The Western States Portland Cement Co. is building a machine shop and store room near Bettendorf, Iowa.

The International Roofing Co., 5333 South Western Avenue, Chicago, has awarded a contract to the Austin Co., 208 South La Salle Street, for a new two-story and basement plant, 100 x 132 ft., on Fifty-third Street, to cost about $75,000. D. E. Watkins is president.

The Markin Auto Body Corporation, 2845 South State Street, Chicago, has been incorporated with a capital of $150,000 by Morris Markins and Max Luster, to manufacture automobile bodies.

The Wittenmeier Machine Co., 850 North Spaulding Avenue, Chicago, is taking bids for a one-story machine shop addition, 28 x 113 ft. S. Scholtes is head.

The Resolute Mfg. Co., 4100 Ravenswood Avenue, Chicago, has been incorporated with a capital of $100,000 by W. Lee Graves, Charles L. McCuen and Hathaway Watson to manufacture machinery and mechanical appliances.

I. Karl Davidson and Ralph O. McGraw, 7732 North Paulina Street, Chicago, have organized the Drill & Tool Co. of America, to manufacture machinery and tools.

The Board of Water Trustees, Des Moines, Iowa, is having plans prepared for a new one-story, electrically operated pumping plant, estimated to cost $150,000. Bids will be asked in about 60 days. Alvord & Burdick, 1416-18 South Dearborn Street, Chicago, are engineers.

The Michelman Steel Construction Co., 137 North Second Street, Quincy, Ill., manufacturer of iron and steel products, will soon take bids for a two-story addition, 100 x 140 ft., estimated to cost in excess of $400,000 with machinery. W. S. Gerdes, company address, is engineer in charge.

The American Lighting & Mfg. Co., 800 Sibley Street, Chicago, has been incorporated with a capital of $100,000 by William J. and F. T. Davis, to manufacture electric lighting equipment and appliances.

Detroit

DETROIT, March 21.

Machine-tool dealers in this district are preparing for considerable improvement in business, owing to the continued increase in automobile production. Orders, however, continue comparatively few and mostly for single machines.

A controlling interest in the Detroit Trailer Co. has been purchased by J. B. Mansfield and his associates of the Mansfield Steel Corporation, Detroit. At the annual meeting of the former company the following officers were elected: J. B. Mansfield, president and general manager; Stephen A. Griggs, Walkerville, Ont., vice-president; F. L. Tully, secretary; E. B. Newton, treasurer. S. A. Griggs, who retires from the presidency of the Detroit Trailer Co., had been active in business for 55 years continuously.

The Gier Pressed Steel Co. unit of the Motor Wheel Corporation, Lansing, Mich., is preparing to manufacture steel truck wheels, in addition to its present line of pressed steel automobile wheels, which will be increased by several new models. It is also increasing its tractor parts output.

The Erdman-Guider Co., Detroit and Saginaw, Mich., has received a substantial order for Sheridan automobile bodies from the General Motors Corporation, construction to be done in the Saginaw plant and the painting and trimming in the Detroit plant.

The Detroit Motor Bus Co., 1701 Dime Bank Building, Detroit, has preliminary plans under way for a new one-story machine shop and service building on Jefferson Avenue.

The Liberty Stamping & Mfg. Co., Detroit, has been incorporated with a capital of $20,000 by Curtis H. Langdorf, Walter S. Scott and William P. Neville, 152 Ashland Avenue, to manufacture stamped metal goods, dies, etc.

The Wheel Truing Brake Shoe Co., 219 Tuxedo Avenue, Detroit, has filed plans for its proposed new two-story plant, 50 x 80 ft., estimated to cost about $50,000. J. M. Griffin is president.

The Ravenna Conklin Electric Light & Power Co., Ravenna, Mich., has preliminary plans under way for a new hydroelectric power plant to cost about $75,000. T. Rogers is manager.

Harry R. Chapman and Marcus J. Green, 2181 Leslie Avenue, Detroit, have organized the Century Saw & Tool Works, to manufacture saws, machine knives and kindred specialties. A repair department will be installed.

Cincinnati

CINCINNATI, March 21.

A slight improvement is noticed in the volume of machine tools business the past week. A number of orders have been received from South America, South Africa and Far Eastern countries, and others are under negotiation. Shipping instructions on machines held up by automotive concerns have been received by several manufacturers, and as a whole the tone of the market is much better than it has been for many weeks. While no large lists are out, a number of inquiries are noted for one and two machines from manufacturers in different parts of the country. The Missouri, Kansas & Texas Railroad, which inquired in January for $500,000 worth of tools, has withdrawn this list for the present, but is in the market for two portable engine lathes for immediate shipment. The Rock Island is also inquiring for several lathes and the Big Four is expected to purchase some equipment for its Beech Grove Shops in the next few weeks. Other projects which will require a number of tools are the Monon Shops at Lafayette, Ind., and the Duesenberg Automobile & Motor Co., which is erecting a plant in Indianapolis. The equipment of this company at Elizabeth, N. J., will be moved to Indianapolis about the first week in May, but additional machinery will be neces-

sary for the new works. The Midwest Engine Co., Indianapolis, is expected to be in the market for considerable equipment. A number of tools have lately been sold to the oil fields in the southwestern section of the State. Dealers report a good business in small used engine lathes, but some difficulty is being experienced in supplying the demand. The Carnegie Steel Co. was a purchaser in the local market the past week, and the Bangor & Aroostook railroad also took two machines.

The Pleasantville Glass Co., Lancaster, Ohio, has increased its capitalization from $75,000 to $175,000. It is the intention to rebuild a plant destroyed by fire last November and construction will start within the next six weeks. A producer gas system will be installed.

The Miami Cycle & Mfg. Co., Middletown, Ohio, has acquired the manufacturing rights of the Roman lubricating system for motor cars which will be manufactured at the main plant.

The Edwin Poulton Foundry Co., Columbus, Ohio, will commence operations in its new plant on West Goodale Street about April 1 and will employ about 50 men. Gray iron castings will be the chief product.

Work has begun on a $300,000 addition to the Pennsylvania Railroad shops at Columbus. It will include heat treating room, tool and locker rooms, erecting shop and storage building. D. W. McGrath, Columbus, has the general contract.

The Logan Clay Products Co., Logan, Ohio, is planning for the erection of a new factory for the manufacture of sewer pipe and kindred specialties, estimated to cost $300,000 with machinery. M. J. Cole is treasurer and general manager.

Pittsburgh

PITTSBURGH, March 21.

Conditions in the machine tool trade show little change. Dealers continue to report the sale of a fair number of individual machines and are figuring on a number of small projects which it is expected will eventually materialize into sales. Preliminary estimates have been made against inquiries for the equipment of two manual training schools but orders are not expected to be placed for several months. The Kempsmith Mfg. Co., Cincinnati, has announced a 15 per cent reduction in its prices on milling machines, meeting a reduction recently announced by other manufacturers. The crane market remains inert with all attention centered in the inquiry of the International Nickel Co., Huntington, W. Va., for which seven cranes will be wanted. This business is expected to be closed this week.

The Lathwood Foundry Co., Thirtieth and Wayne streets, Pittsburgh, manufacturer of iron and steel castings, has filed plans for a one-story addition, to cost about $10,000. A. L. Lathwood is head.

The George Naismith & Son Co., Pittsburgh, is being organized by George and Donald McN. Naismith and Edward C. Blumer, to manufacture boilers, furnaces and other plate specialties. Application for a State charter will be made on April 5. F. R. Stoner, 1621 Oliver Building, represents the company.

William Fowler, East Bradford, Pa., is considering plans for a new one-story foundry, 35 x 150 ft., for the manufacture of iron and steel castings.

The Leard Mfg. Co., Pittsburgh, is being organized by William S. Leard, Herbert R. Hahn and J. Weinman Cratty, 1412 Berger Building, to manufacture lawn mowers and parts, and other iron and steel products. Application for a State charter will be made on March 28.

The East End Auto Repair Co., Pittsburgh, is being organized by J. J. and E. E. Mosberger, and C. I. Braun, to operate a machine and repair works, manufacture automobile and motorcycle parts, etc. Application for a State charter will be made on April 11. John H. Scott, 408 Union Arcade Building, represents the company.

A new pumping plant will be constructed by the Board of Works, Shinnston, W. Va., in connection with a new filter plant, the installation to comprise centrifugal pumping machinery and auxiliary operating apparatus. The Roberts Engineering Co., Charleston, W. Va., is engineer.

The Star Car & Foundry Co., 412-14 Eleventh Street, Huntington, W. Va., has preliminary plans under way for its proposed one-story brick addition.

Six new automatic blowing machines and considerable other machinery will be installed in the new addition to be constructed by the West Virginia Glass Mfg. Co., Huntington, W. Va., with cost estimated at about $100,000. B. G. Landau is general manager.

Baltimore

BALTIMORE, March 21.

Dietrich Brothers, Pleasant and Davis streets, Baltimore, manufacturers of iron and steel products, will take bids early in April for their new one-story steel fabricating plant, 190 x 330 ft., on Waverly Street, to cost about $350,000, including machinery. Plans are being completed.

The Chatham Light & Power Co., Chatham, Va., is planning for the erection of a new unit at its power plant to double the present capacity.

The Phillip-Kell Co., Holliday and Center streets, Baltimore, manufacturer of metal products, will take bids in about 60 days for the erection of its proposed new plant at Hanover, to be one and two stories, 70 x 165 ft., and estimated to cost about $50,000. Revised plans are being drawn.

A machine shop for parts manufacture and general repair work will be installed in the new automobile service building to be erected by the Chesapeake & Potomac Telephone Co., 118 East Lexington Street, Baltimore, to be 100 x 110 ft.

The Virginian Railway Co., Terminal Building, Norfolk, Va., will soon take bids for extensions and improvements in its shops and engine house at Elmore, W. Va., to cost about $40,000.

The Prudential Oil Co., Fairfield, Baltimore, has acquired a portion of the Bowles property, totaling about 30 acres, with considerable waterfrontage. It will be used in connection with the proposed oil refinery of the company in this district, estimated to cost close to $1,000,000 with machinery.

The Eastern Trailer Co., Inc., 2748 Riggs Avenue, Baltimore, has been incorporated with a capital of $20,000 by Theodore E. Alcott, Noel T. Haralson and John J. Neubauer to manufacture trailer parts and equipment.

Morton McI. Dukehart & Co., 641 Light Street, Baltimore, manufacturer of pumping machinery, etc., has awarded contract to John Macht, 3903 Galloway Avenue, for its proposed one-story machine shop at Race and McComas streets, 40x118 ft., to cost $15,000. Ground will be broken at once.

A new power plant, 93 x 142 ft., to cost about $50,000, will be constructed by the Standard Oil Co. at its plant at Third Avenue and Second Street, Canton.

The Steel Products Co., Savannah, Ga., has plans under way for the erection of additions to double, approximately, the present capacity. A large portion of the extensions will be given over to steel fabricating shops. J. P. Wheless is president.

The Johnson Mfg. Co., Main and Market streets, Danville, Va., recently organized to manufacture metal bottle openers and similar specialties, will operate a local plant with initial capacity of about 500 openers per day. J. A. Johnson is president.

The Bureau of Yards and Docks, Navy Department, Washington, D. C., is planning for the construction of a new one-story machine shop at the naval base at Hampton Roads, Va. A machine and repair works will also be erected by the department at Anacostia, near Washington.

The McLeod Leather & Belting Co., Greensboro, N. C., has been incorporated with a capital of $200,000 to manufacture mechanical leather goods, belting, etc. W. T. McLeod is president and J. A. Schachner, vice-president and manager.

Cleveland

CLEVELAND, March 21.

Little change developed in the machinery market the past week, but a few signs indicate that some improvement may be looked for. The demand is still mostly for single machines, and in most cases buyers are purchasing used machinery if it will answer their purpose. Local houses report that in a few cases on which they have made quotations the business has been lost in competition with Eastern dealers who offered at lower prices new machinery formerly owned by the Government. The first report of a demand for machinery in the rubber industry since the falling off last year came in the announcement of the release the past week of three boring machines by Akron shops that specialize on tire molds. Shipments of these machines had been held up and the release in the form of new contracts came shortly after the announcement of a price reduction by the boring machine manufacturer having the order. Some machine-tool builders, while not getting more inquiries, report an improvement in the demand for repair parts which is regarded as favorable. The demand for wood-working machinery has improved

materially and dealers are now getting a fair volume of business in this line.

The Ann Arbor Railroad, which recently inquired for an axle lathe, a car wheel press and car wheel boring machine, in addition to considerable wood-working equipment for its Owosso, Mich., shops, has purchased the wood-working machinery, but is trying to supply its metal-working machinery requirements with used machinery.

No further price changes are reported here. However, one leading machine tool builder is now allowing its dealers to quote a 12½ per cent reduction on its shapers, and it is expected that this action will be followed by a more formal price reduction on this line.

The Iron King Implement Co., Madison, Ohio, has been incorporated to manufacture agricultural implements and will erect a plant.

The Simplicity Products Co., which has been operating a plant in Grand Rapids, Mich., has moved to Madison, Ohio, where it has purchased a factory and plans to erect additional buildings. It manufactures automobile parts.

The Sterling Brass Co., Cleveland, has had plans prepared for a brass foundry and machine shop, 75 x 90 ft.

The Gabriel Mfg. Co., 1407 East Fortieth Street, Cleveland, is planning to erect a new factory adjoining its present site for the manufacture of automobile shock absorbers. When completed the present plant will be used for storage purposes.

The Buckeye Casting Co., Lima, Ohio, is having revised plans prepared for its new foundry buildings, to consist of two one-story structures, each 40 x 40 ft., estimated to cost about $75,000. Bids will be asked early in May. John Sonnerbaum is head.

The Landall Farm Tractor Co., Carey, Ohio, is considering the erection of a new plant to cost about $50,000. I. D. Houton is president.

Indiana

INDIANAPOLIS, March 21.

F. J. Schneider, Indianapolis, has filed plans for a one-story machine shop, 75 x 100 ft., on Ray Street, to cost about $25,000.

The Redinger-Ball-Morris Mfg. Co., Logansport, Ind., has been incorporated with a capital of $25,000 by I. R. Redinger, William Ball and M. W. Morris, Logansport, to manufacture machinery and parts.

Fire, March 12, destroyed the plant of the Harper Buggy Co., Columbia City, Ind., with loss estimated at $150,000, including machinery. It is said that it will be rebuilt.

A. D. Cook, Inc., Greendale, Ind., has been incorporated with a capital of $400,000 by A. D. and A. M. Cook and A. C. O'Brien, to manufacture pumping machinery and parts.

Fire, March 17, destroyed the repair works and plant of the Warren Garage, Elkhart, Ind., with loss estimated at about $100,000. B. L. Losee is head.

The Duesenberg Automobile & Motors Co., Lemcke Building, Indianapolis, has commenced the erection of the superstructure of its new one-story plant on West Vermont Street, 90 x 500 ft., for the manufacture of automobile motors. It is estimated to cost about $150,000.

Milwaukee

MILWAUKEE, March 21.

No important developments have appeared in the machine tool trade the past week. New business continues in single-tool requirements, the aggregate of which, however, constitutes only a small volume. On the other hand, encouragement is lent by a gradual increase in inquiry, the source of which is broadening and manifesting a wider interest. Makers of milling machines are receiving scattering orders from a wide variety of sources, but so far have not been able to make any extension of production schedules. Some railroad requirements are represented in current inquiry and confidence is expressed that at least a small volume of business will develop within a short time.

The A. E. Martin Foundry & Machine Co., 705 Park Street, Milwaukee, has awarded contract to John L. Stanage, consulting engineer, 144 Oneida Street, for a two-story brick and concrete shop addition, 30 x 75 ft., costing about $15,000 complete. The Martin company specializes in cylinder and piston castings for air-cooled internal combustion engines.

The Randolph Wagon Works, Randolph, Wis., has broken ground for a new factory, 100 x 120 ft., of brick construction, with sawtooth roof. The general contractor is the Hutter Construction Co., Fond du Lac, Wis. The new factory, with wood-working tools, forge equipment, etc., will cost about $45,000.

The General Device Co., New Lisbon, Wis., has been incorporated with an authorized capital stock of $100,000 to manufacture a line of patented mechanical devices. The incorporators are F. W. Bolzendahl, R. C. Arpagaus and E. V. Brunette. Definite plans of the new enterprise have not yet been announced.

The Hercules Steel Casting Co., 871-891 Robinson Avenue, Milwaukee, has increased its authorized capital stock from $300,000 to $400,000, the new issue consisting of $100,000 of 7 per cent participating preferred stock. The proceeds are to be used to purchase additional land and equipment and to increase the working capital. It manufactures electric steel castings exclusively. Frank E. McIntyre is general manager.

The Chicago, Milwaukee & St. Paul Railroad Co. is installing additional tool equipment costing about $12,000 in its division repair and maintenance shops at LaCrosse, Wis. The list includes lathes, boring mill, milling machine, drill presses, etc.

The Viroqua Crystal Ice Co., Viroqua, Wis., which is erecting an artificial ice plant and warehouse, has placed an order for a 6-ton ice machine with the Berge Machine Co., Chicago, for installation by May 15.

The American Seating Co., Manitowoc, Wis., has awarded contracts for a two-story brick and concrete addition, 48 x 120 ft., with steel sidewall and monitor sash. The general contractor is the E. R. Herman Co., local. The work will cost about $35,000, including some new equipment now being purchased.

The Badger Auto Equipment Co., Milwaukee, has been granted a charter to manufacture automotive accessories, devices and supplies. The incorporators are A. J. Chuminski, J. Lenasek and Fred Simerl, 375 Hanover Street, Milwaukee.

The Ludolf M. Hansen Co., Green Bay, Wis., has taken the general contract for the construction of a new high and vocational training school at Two Rivers, Wis., at a total cost of about $450,000. Manual training and other shop equipment has not yet been purchased. The architect is John D. Chubb, Chicago. A separate boiler house is part of the project.

The Goddard Rubber Co., Fort Atkinson, Wis., is being organized by Dr. William Goddard, Watertown, Wis., and will be incorporated with a capital stock of $100,000 to manufacture rubber goods. Temporary quarters have been leased in Fort Atkinson and equipment is now being ordered.

The General Industrial X-Ray Co., Milwaukee, has been organized with $100,000 capital, to manufacture medical equipment. The incorporators are E. H. Karrer, William Guilliaume and Otto Hermann. Mr. Karrer is president of the E. H. Karrer Co., 246 West Water Street, Milwaukee, manufacturer of surgical instruments.

The Board of Education, Chippewa Falls, Wis., has been granted an appropriation of $350,000 to erect and equip a junior high and vocational training school. An architect will be selected at once. It is hoped to start construction before midsummer.

Lange Brothers, Two Rivers, Wis., machinists and automotive repairmen, have purchased a site and will erect a new building, 50 x 100 ft., one-story and part basement, to cost about $20,000 including equipment.

The Suring Mfg. Co., Suring, Wis., which has been incorporated with a capital stock of $40,000, will not manufacture barn equipment for the present, but will erect a factory costing about $30,000 equipped for manufacturing wooden boxes, veneers, crating stock, etc. A. C. Kubiak is president.

The Schoeffler-Graham Mfg. Co., Milwaukee, which recently was incorporated with a capital stock of $50,000 to succeed to the partnership business of Schoeffler & Graham, machinists, 158 Reed Street, is taking over additional floor space and will install equipment for the manufacture of horizontal mechanical hoists for motor trucks with dump bodies. A. P. Schoeffler is president; C. A. Graham, vice-president, and R. B. Randall, secretary and treasurer.

The Board of Education, LaCrosse, Wis., has accepted the bid of the F. R. Schwalbe Co., local, for the general contract on the proposed new junior high and vocational training school at a price of $158,041. The equipment for manual training shops, estimated to cost about $30,000, will be purchased later. The architects are Parkinson & Dockendorff, LaCrosse.

The Northwest Engineering Works, Green Bay, Wis.,

has started the operation of its new foundry and machine shop, which was officially opened on March 10. It will concentrate upon the production of a new type of crane and hoist, mounted on a crawler type of tractor chassis, obviating the use of tracks or rails, designed especially for industrial yard use, logging, quarrying, and similar purposes. It will also make special equipment for building and highway construction, having formed a working arrangement with the Ludolf M. Hansen Construction Co., Green Bay. Ludolf M. Hansen has been added to the board of directors of the Northwest company.

The Gulf States

BIRMINGHAM, March 21.

The National Well Supply Co., Pensacola, Fla., recently organized with a capital of $200,000 to form a consolidation of the Gray Artesian Well Co., Pensacola, and the National Well & Pump Co., Stuttgart, Ark., is perfecting plans for new works at Birmingham for the manufacture of deep-well pumping machinery and well supplies. M. J. Gray, Pensacola, is vice-president and general manager.

About $2,500,000 will be expended for buildings and machinery by the United States Window Glass Co., Morgantown, W. Va., for its new plant at Shreveport, La. It has a large tract of land at Jewella and has completed plans for the initial units to cost about $1,000,000. Ground will be broken at an early date. Walter A. Jones is president.

The Wichita Airplane Service Co., Wichita Falls, Tex., recently organized, is planning for the establishment of a factory for aircraft rebuilding and repair work. A machine shop will be installed for parts production, etc. The initial equipment installation will cost about $15,000. H. K. Neal is secretary.

The San Antonio, Rock Springs & Western Railroad Co., San Antonio, Tex., is negotiating for the purchase of about 160 acres on the western outskirts of the city as a site for its new locomotive and car shops, including machine shop, metal and wood-working plant, foundry, etc.

The Pilkington Boat Yards, Miami, Fla., are planning for improvements in their plant, to include remodeling of present buildings and installation of new equipment. A marine railroad will be constructed and hoisting machinery installed.

The Vanstory Mowing Machine Cutters Co., Rienzi, Miss., has been organized by W. J. Vanstory and B. W. Burnett to manufacture mowing machines, cutters and parts.

The Berger Mfg. Co., Canton, Ohio, manufacturer of metal building products, has plans under way for a new branch factory at Corinth and Pearl streets, Dallas, Tex. It will be one story, 220 x 220 ft., with office extension, 30 x 100 ft. George B. Calvin is local manager.

D. Souter, 647 St. Mary Street, Baton Rouge, La., is planning for the installation of equipment at his new wire manufacturing plant, to include wire-forming machinery, stamping machines for sheet metal work, etc.

B. H. Elliott, Inc., Houston, Tex., recently organized to operate a shipyard, has plans under way for the establishment of its initial plant at Harrisburg, Tex. It will be used primarily for repairs and will comprise a machine shop, 60 x 100 ft., and other buildings. B. H. Elliott is president and manager.

The San Antonio, Rock Springs & Western Railroad, with headquarters at San Antonio, is negotiating for the purchase of 160 acres adjacent to that city, on which it will build shops and terminals.

The Bryan Automatic Shoe Polishing Co., Bryan, plans to build a factory to cost about $75,000 for the manufacture of its shoe-polishing device.

The Crescent Co., Denton, Tex., is preparing to build an oil refinery with a daily capacity of 75 bbl. J. A. Minnis is president.

The Central South

ST. LOUIS, March 21.

The Union Iron Works, 623 Kentucky Avenue, Joplin, Mo., will make a number of improvements and extensions in its plant, including the installation of new machinery and construction of a power house, 20 x 40 ft. William Buttrum is manager.

The Atchison, Topeka & Santa Fe Railway Co., Chicago, has work under way on a new one-story machine shop, 102 x 125 ft., at Kansas City, Kan., to cost about $50,000. A new one-story forge shop, 40 x 75 ft., will also be constructed at Newton, Kan., to cost about $15,000.

The Sanitary Screen Mfg. Co., Oklahoma City, Okla., has been incorporated with a capital of $50,000 by Frank L. Bell and Carl L. Harris, Oklahoma City, and James H. Randall, Lawton, Okla., to manufacture metal screens, and other wire goods.

The Muskogee Airplane Co., Muskogee, Okla., has been incorporated with a capital of $25,000 by J. B. Witt, M. H. Wood and M. Hicks, Muskogee, to manufacture aircraft and parts.

Bids will be asked by the Common Council, Harrodsburg, Ky., at an early date for its proposed new municipal electric power plant, to be operated in conjunction with the waterworks system, estimated to cost about $100,000. J. G. Pulliam is mayor. Pearce Greeley, 39 West Adams Street, Chicago, is engineer.

The Cin-O-Del Co., Ludlow, Ky., has been incorporated with a capital of $100,000 by Aaron D. Blackwell, and J. C. Murrill, Ludlow, to manufacture metal products.

The Cleveland Machinery Co., Cleveland, Tenn., has been incorporated with a capital of $25,000 by D. D. Triplett, J. T. Huffine and Charles A. Homer, Cleveland, to manufacture machinery and parts.

The Holloran-McLean Tractor Co., Nashville, Tenn., has been incorporated with a capital of $50,000 by R. D. McLean, F. L. Holloran and William C. McLean, to manufacture tractor parts and equipment.

A new one-story power house, 40 x 100 ft., to cost about $35,000 will be erected by the Western Tablet Co., Kansas City, Mo., at its factory at Eleventh and Mitchell streets.

The Sinclair Pipe Line Co., Tulsa, Okla., will construct about 75 miles of pipe line and equip pumping stations.

Swift & Co., Chicago, Ill., will equip a $100,000 refrigerating plant at Tulsa, Okla.

California

SAN FRANCISCO, March 16.

Although the market for machine tools may not be termed active, some business is being done and it is generally agreed that prospects for the future are brighter. Inquiries are beginning to come from a variety of sources.

The Coast Tire & Rubber Co., capitalized at $5,000,000, has just completed a plant in East Oakland, Cal., and it is expected that manufacturing will begin in April. H. G. Blanchard, formerly chief engineer of the United States Tire & Rubber Co., is factory manager. The new plant covers approximately six acres and consists of the main building, 275 x 400 ft., and a two-story administration building, 50 x 100 ft., representing an outlay of about $1,000,000. About $350,000 in orders have already been placed.

Incorporation papers have been filed by the International Automotive & Equipment Co., with headquarters at Oakland, Cal. Fred B. Aubert is a director. The company will develop the new Holaway inventions, including stuffing boxes and a new type of piston rod glands.

A plant will be erected at Santa Clara, Cal., for the manufacture of a patent desiccator just perfected by P. Mahon, F. J. Rich and J. Adrian, Oakland.

The Kroyer Motors Co., Stockton, Cal., has awarded contract to the Austin Co., Pacific Building, San Francisco, for its new plant unit, one story, 90 x 440 ft., and estimated to cost about $200,000. A portion of the structure will be equipped for assembling. Other units will be erected in the near future.

The Acme Presser Mfg. Co., 1405 North Hill Street, Pasadena, Cal., has filed notice of organization to manufacture machinery and mechanical equipment. The company is headed by Edward A. Kring and Eugene G. Mattison.

The Pacific Spring Bed Co., 2326 Fourth Street, Berkeley, Cal., has taken bids for a new two-story building, 52 x 100 ft., to cost about $22,000. James W. Plachek, 2014 Shattuck Avenue, is architect.

The Glendale Sheet Metal Works, Glendale, Cal., has filed notice of organization to manufacture metal specialties. It is headed by Edward Kretchmer, 526 North Central Avenue.

The Phillips Heating & Ventilating Co., Los Angeles, manufacturer of heating and ventilating equipment, has awarded contract to Frank L. Froley, 942 South Normandie Avenue, for a new one-story factory, 50 x 130 ft., at 1710 West Washington Street.

The Master Timer Mfg. Co., 3020 South Main Street, Los Angeles, has filed notice of organization to manufacture automatic timing apparatus for industrial and other service. It is headed by P. A. Sipes, 130 East Twenty-seventh Street.

Machine shop and foundry equipment and other mechanical and electrical apparatus will be installed in the manual

training building to be erected by the Board of City Trustees, Covina, Cal., in connection with a new high school to cost about $350,000. The project will comprise three buildings, one of which will be given over entirely to manual training.

The Standard Oil Co., 1727 North Spring Street, Los Angeles, has had plans prepared for new service buildings at 415 East Slauson Avenue, to include tool works, machine shop, pump house, etc., and to cost about $37,000.

The Atlas Automobile Repair Co., Los Angeles, has filed notice of organization to operate a general machine and repair works at 627 East Third Street, including parts manufacture, etc. The company is headed by Earl Gorham, 7029 Makee Avenue.

Canada

TORONTO, March 21.

The demand for machine tools in this market continues light. Inquiries for various lines of equipment are numerous and it is expected that a considerable number will eventually turn into sales. Very little buying has been done by the railroads, and companies with industrial plants under way are also backward in placing orders. A steady demand exists, however, for machinery and tools from the mining districts of Ontario and a considerable volume is moving. Second-hand equipment is in good call and some fair sized sales have recently been made. Small tools are less active.

The Royal Brush Co., Hamilton, Ont., is asking for a small second-hand planer, 16 or 18-in., with long bed; also cut off and rip saw.

The Supercharge Engine Co. of Canada, Ltd., 120 St. James Street, Montreal, will receive bids for the erection of a plant and will purchase the necessary equipment.

The Temiskaming & Northern Ontario Railway Commission, 56 Church Street, Toronto, will build shops and engine houses to cost about $80,000 and will spend $57,500 on equipment.

The machine shop, boiler house and forge of the Nova Scotia Steel & Coal Co.'s shipbuilding plant at Trenton, N. S., recently destroyed by fire with a loss of $60,000, will be rebuilt at once and new equipment purchased.

The Gove Motor Co., Tillbury, Ont., will start work about April 1 on the erection of factory to manufacture automobiles and trucks and will be in the market for metal-working machinery and special equipment.

W. Cross, Chelsea Road, Hull, Que., will build a garage and is asking for prices on equipment.

The Consolidated Motors Co., Ltd., Toronto, will start work about April 1 on the erection of a garage and repair shop to cost $75,000.

The Brown Pulp & Paper Co., Ste. Angele, Que., will build pulp and paper mills there this spring.

The Engineering & Machine Works of Canada, Ltd., St. Catharines, Ont., desires a high embossing type press for making ½-in. letters and figures for numbering wood patterns.

The Mimico-New Toronto Joint Sewage Commission, Mimico, Ont., will purchase pumps of 2000 and 1500 gal. per min. capacity for a pumping station.

The Winchester Repeating Arms Co., 275 Winchester Avenue, New Haven, Conn., is contemplating the erection of a factory at Hamilton, Ont., to cost about $500,000.

The Taylor Airless Tire Co., Detroit, is contemplating the erection of a factory at Leamington, Ont., to have a daily capacity of 300 tubes, and cost about $1,000,000.

The Liberty Tire & Rubber Co., Montreal, is preparing plans for the erection of a factory to cost $150,000. J. O. Gourre, 311 Transportation Building, Montreal, is engineer.

The Alberta & Arctic Transportation Co., Fort McMurray, Alta., has secured a site and will proceed with the erection of shipyards for the construction of vessels. W. J. West is manager.

H. B. Charade, 2770 Hutchison Street, Montreal, will build an automobile repair shop and is interested in prices on general equipment.

The Canadian General Electric Co., 212 King Street West, Toronto, is receiving bids for the erection of a power house at Peterboro, Ont.

The National Castings, Ltd., Belleville, Ont., will start work in the near future on the erection of a foundry and other additions.

SHORT TRADE ITEMS

The Luntz Iron & Steel Co., Canton, Ohio, scrap iron and metals, recently acquired 50 per cent interest in the Akron Scrap Iron Co., Akron, Ohio. As a result of this change, D. S. Luntz, A. M. Luntz and William Goldsmith of the Luntz Iron & Steel Co., have become directors of the Akron Scrap Iron Co., together with Isador Brown and Leo Meyers, representing the old interests in the Akron Scrap Iron Co. No change is contemplated in the operation of the Akron company, the accounts and management of which will be handled in Akron as heretofore. The result of the change will be reflected chiefly in providing wider service to the customers of both companies.

The Merkle Machinery Co., 1733 Walnut Street, Kansas City, Mo., has been appointed Western selling agency for the Under-Feed Stoker Co. of America, maker of the Jones under-feed stoker. This is a thoroughly established selling agency with branches in Omaha, Neb., at 621 Securities Building, and in Tulsa, Okla., at 209 Seaman Building. M. L. Alison, 616 Newhouse Building, has been appointed to the Salt Lake City territory. A new Southern agency is announced in Dallas, Tex., represented by Smith & Whitney, Southwestern Life Building.

The Scott-Spencer Automatic Tool Co., Cincinnati, which specializes in the manufacture of high-speed milling cutters, announces the following appointments: Manager of New York office, 617 Candler Building, George H. Bowers; manager of Chicago office, 1543 First National Bank Building, G. O. Watson; manager of Detroit office, 621 West Jefferson Street, Chester Jones. All of these offices have been recently opened. The company also announces a reduction of 25 per cent in its selling prices.

Harold A. Wright, 201 Devonshire Street, Boston, machine-shop machinery, has been made New England representative for the Hamilton Machine Tool Co., Hamilton, Ohio, line of lathes and planers, as well as the Precision Castings Co., Inc., Syracuse, N. Y., line of die-castings.

The Community Steel Corporation has been organized for designing and fabricating commodities from rolled materials. These include light structural iron and steel, safety devices and guards, racks and tanks. General offices and plant are at 188-192 Myrtle Avenue, Buffalo. The officers are: Fran's Herzog, president; Charles A. Faessler, vice-president; Milford R. Burgwardt, secretary and treasurer.

The Iron City Coal & Coke Co., with offices in the Columbia Bank Building, Pittsburgh, has been organized by Herbert G. Parker and William H. Scanlon, formerly connected with A. M. Moreland & Co. The company will be sales agent for the Ollett Bros. Coal Co., Bridgeville, Pa.

Westernman & Co., manufacturer of bar iron, Lockport, N. Y., has become incorporated as Westernman & Co., Inc. Calvin G. Sutliff is chairman of the board of directors; Gilbert T. Sugden, president and treasurer, and Charles F. Magoffin, vice-president and manager.

OFFICE CHANGES

Philip T. King, cranes and contractors' equipment, is now located permanently in Suite 626, 30 Church Street, New York. Mr. King was formerly connected with the New York sales office of the Ohio Locomotive Crane Co. and the Bedford Foundry & Machine Co.

The Gillespie Eden Corporation, 50 Church Street, has moved to 7 Dey Street, New York.

The office of the Connellsville Foundry, Machine & Steel Casting Co., Pittsburgh, has been moved from 404 House Building to 1212 Park Building, that city.

The Blaw-Knox Co., Pittsburgh, on April 1, will open a new sales office in Kansas City, located in the Interstate Building, in charge of R. B. Randall, formerly connected with the company's Chicago office, who will be known as manager of the southwestern territory. The opening of this office gives the company eight branch offices which are located in New York, Chicago, Detroit, Boston, Baltimore, Birmingham, San Francisco and Sheffield, England.

A part of the general office force of the Walworth Mfg. Co., wrenches, fittings, etc., has been moved from the plant in South Boston to new quarters at the corner of High and Pearl streets, Boston, where one floor is available. The rest of the general office force will be moved from the plant as soon as the other floor in the new quarters is available, which probably will be within a month. The manufacturing office force will remain at the South Boston plant.

NEW TRADE PUBLICATIONS

Calendars.—Combustion Engineering Corporation, New York. Size 12½ x 16½ in. The upper part of each page contains a half-tone view of various types of stokers made by this company, other pages showing installations of the Lopulco pulverized fuel system. The calendar half is printed in black and red, with a list of branch offices on each side of it.

Calendar.—Otis Hidden Co., Louisville, Ky. Size 15 x 29 in. poster style. Lower 6 in. occupied by calendar in red and black. Upper portion occupied by life-size picture of "Tom Hidden," a cat, the trade mark of the company.

Steel Pipe.—National Tube Co., Pittsburgh. Bulletin No. 5 E. Size 8½ x 11 in.; 46 pages. Describes and illustrates the use and merit of National pipe in refrigeration service. Numerous illustrations of actual installations and several pages of tables and useful data are given.

Portable Electric Drills.—Neil & Smith Electric Tool Co., Cincinnati. Drill Bulletin No. 9. Illustrates and describes universal current drills, single and two speed, chuck types and Morse taper socket types. Direct current drills are similarly described. A page is devoted to comparative tests of six different makes of electrical drills. Size 6 x 9 in.; 12 pages.

Calendar.—Osborn Mfg. Co., Cleveland. Size 14 x 18 in. The calendar pad is white on a black background, begins with March, 1921, and ends with February, 1922, occupying the lower portion of each page. The upper portion of the page is given to views of various molding rooms and Osborn machine-made molds. The front page is devoted to a message to the receiver of the calendar and the last page to a calendar for 1920 and 1922.

Calendar.—Heine Safety Boiler Co., St. Louis. Size 12 x 37 in. The calendar pad occupies the lower two-thirds of the sheet, the current month being in black on white, with the previous and succeeding month in blue on white. The upper portion displays various installations and types of Heine boilers.

Roller Bearings.—American Roller Bearing Co., Pittsburgh. Bulletin No. 1005. Size 6¾ x 10 in., 27 pages. Describes the construction and use of Type C roller bearings, heavy duty and standard. The illustrations comprise various equipment on which these bearings are used. Tables of dimensions and list prices are given.

Gas Producers.—The George J. Hagan Co., Pittsburgh. Illustrated bulletin describing the Hagan hand stoked producer. An installation of four producers in a sheet and tin plate mill is illustrated as are also the 15-ft. 3-in. size producer, sectional views of which are given. A cross-section diagram of this producer and of the producer house are presented, together with a layout of a battery of four producers. The bulletin treats on the characteristics of the gas produced, the rate of gasification, the amount of steam necessary and its control, the handling of coal and ash and the labor entailed in operation. There are three tables on the feasibility of coal ash from coals from several fields.

Wrought Iron Pipe.—Reading Iron Co., Reading, Pa. Bulletin No. 2. Size 8½ x 11 in.; 9 pages. Discusses the structural difference between wrought iron and steel, and their relation to the field of welded pipe. Photo micrographs comprise the illustrations.

Engineering Construction.—J. A. White Engineering Corporation, 43 Exchange Place, New York. Size 8 x 11; 31 pages. Various large installations of power and hydro-electric developments and transmission systems in the United States and foreign countries described and illustrated.

Compressors.—Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York. Bulletin No. 607. Size 6 x 9 in., 32 pages. Describes and illustrates construction details of Class N-S02 Chicago pneumatic oil engine driven compressors, stationary and portable type. A table comparing operating costs of N-S02 14-in. compressor and an equivalent size of steam-driven machine is included.

Tools.—Goodell-Pratt Co., Greenfield, Mass. Tool book No. 14. Size 3¾ x 5⅝ in., 462 pages. Illustrates and describes over 2000 sizes and kinds of tools used by toolmakers, machinists, carpenters and automobile mechanics.

Radiator Trap.—Trane Co., La Crosse, Wis. Bulletin No. 6-A. A compilation of tests made in the Trane Co. laboratories of the Trane Thermetal Radiator Trap. Size 6 x 9 in., 8 pages.

Scraper Conveyors.—Jeffrey Mfg. Co., Columbus, Ohio. Catalog No. 257. Size 8½ x 11 in., 83 pages. Features both single and double strand conveyors designed to handle all kinds of loose products in manufacturing and mining industries, power plants, coal yards, sugar mills and other industries. Illustrations of actual installations in various industries and illustrations of the various types of chains used on these conveyors are given. Several pages are devoted to specifications and dimensions designed to aid the purchaser in selecting the right conveyor for his needs.

Cupolas.—Whiting Corporation, Harvey, Ill. Bulletin No. 155, superseding No. 152. Size 6 x 9 in., 32 pages. Contains list of users of Whiting cupolas, classified by size of cupola used.

Motors.—Wagner Electric Mfg. Co., St. Louis. Bulletin 127. Size 8 x 10½ in., 8 pages. Describes and illustrates Wagner single-phase motors of the BA and BB types.

Transformers.—Wagner Electric Mfg. Co., St. Louis. Bulletin 128. Size 8 x 10½ in., 8 pages. Devoted to description of mechanical features of Wagner distribution type transformers, shell and core.

Diesel Engines.—Nordberg Mfg. Co., Milwaukee, Wis. Bulletin No. 31. Size 8 x 10½, 25 pages. Describes and illustrates in detail the important features of the three types of Nordberg Diesel engines. Space is given to the fuel oil situation, the requirements of a Diesel engine and the principle of the two-cycle engine. The illustrations include views of Nordberg engines driving generators and air compressors.

Gears.—Niles-Bement-Pond Co., 111 Broadway, New York. A 16-page, 9 x 11-in. booklet devoted to the Maag system of gear generation. The advantages of Maag gears are discussed, the Maag rack-shaped cutters illustrated, and a description of Maag spiral, helical and herringbone gears included.

Charging Machines.—Morgan Engineering Co., Alliance, Ohio. Bulletin No. 20. Illustrates high and low type of open-hearth floor charging machines and also overhead horizontal chargers for charging open-hearths and reheating furnaces. This bulletin is 8½ x 11 in.., with 36 pages.

Pyrometers.—Thwing Instrument Co., Lancaster Avenue, Philadelphia. Bulletin 10. Size 8 x 10½ in., 20 pages. Devoted to a description of the Thwing thermo-electric pyrometers of the indicating and multiple recording types. Thwing thermocouples, multiple-record high-resistance recorders and indicating galvanometers are also discussed in detail.

Riveters.—Hanna Engineering Works, Elston Avenue, Chicago. Catalog No. 4. Size 6 x 9 in., 64 pages. Devoted to a general description of the Hanna riveter, with illustrations and applications of particular types manufactured. Line drawings and schedules of dimensions are included.

Milling Cutters.—Pratt & Whitney Co., Hartford, Conn. Circular No. 259. Describes development and advantages of "Curvex" cutters, formed milling cutters with spiral teeth and with eccentric relief. A section is devoted to "Curvex" hobs and another to a specially designed machine for grinding "Curvex" cutters. Size 6 x 9 in., 12 pages.

New Books Received

Electric Welding. By Ethan Viall. Pages xii + 417; 6 x 9 in. Published by McGraw-Hill Book Co., 370 Seventh Avenue, New York.

Gas Torch and Thermit Welding. By Ethan Viall. Pages xi + 442; 6 x 9 in. Published by McGraw-Hill Book Co., 370 Seventh Avenue, New York.

Acceptances, Trade and Bankers'. By Park Mathewson. Pages xiv + 372. Published by D. Appleton & Co., 35 West Thirty-second Street, New York.

The United States Bureau of Mines has just issued bulletin 185, "Pennsylvania Mining Statutes Annotated," by J. W. Thompson, law examiner of the bureau. The bulletin includes every statute enacted by the legislature of Pennsylvania from 1785 to 1919, relating to minerals, mines, and mining operations, whether obsolete, repealed, invalid, or at present in force. In the bulletin, statutes have been classified according to subject matter, bringing into a single group all legislation pertaining to a definite subject, as fire bosses, inspection districts, inspectors, mine foremen, miners' examining boards, mining operations, etc. Following each law are given abstracts of the decisions of all courts that have placed a construction on such law. Copies of the bulletin may be purchased from the Superintendent of Documents, Government Printing Office, Washington, at a price of $1.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined bars, base price	3.58c.
Swedish bars, base price	15.00c.
Soft steel bars, base price	3.58c.
Hoops, base price	4.33c. to 4.53c.
Bands, base price	4.28c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.68c.
Channels, angles and tees under 3 in. x ¼ in., base	3.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.65c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.85c.
Toe calk, ½ x ⅜ in. and larger	4.25c.
Cold-rolled strip, soft and quarter hard	10.00c. to 10.50c.
Open-hearth spring steel	4.70c. to 8.00c.
Shafting and Screw Stock:	
Rounds	5.50c.
Squares, flats and hex	6.00c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c.
Extra best cast steel	25.00c.

Tank Plates—Steel

¼ in. and heavier	3.88c.

Sheets

Blue Annealed	Per Lb.
No. 10	4.50c. to 4.78c.
No. 12	4.55c. to 4.83c.
No. 14	4.60c. to 4.88c.
No. 16	4.70c. to 4.98c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Wood's Refined, Per Lb.
Nos. 18 to 20	5.05c. to 5.63c.	.....
Nos. 22 and 24	5.10c. to 5.68c.	6.05c.
No. 26	5.15c. to 5.73c.	6.15c.
No. 28	5.25c. to 5.83c.	6.25c.
No. 30	5.50c. to 6.08c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized	Per Lb.
No. 14	5.00c. to 6.23c.
No. 16	5.25c. to 6.48c.
Nos. 18 and 20	5.40c. to 6.63c.
Nos. 22 and 24	5.55c. to 6.78c.
No. 26	5.70c. to 6.93c.
No. 27	5.85c. to 7.08c.
No. 28	6.00c. to 7.23c.
No. 30	6.50c. to 7.73c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk.	Galv.
½ in. Butt...	—40	—23
¾-3 in. Butt.	—44	—28
3½-6 in. Lap.	—39	—24
7-12 in. Lap..	—32	—15

Wrought Iron	Blk.	Galv.
¾-1½ in. Butt.	—13	+ 6
2 in. Lap.....	— 8	+10
2½-6 in. Lap..	—10	+ 5
7-12 in. Lap....	list	+16

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.75c.
Annealed soft	5.75c.
Galvanized annealed	6.50c.
Coppered basic	6.25c.
Tinned soft Bessemer	7.25c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	18 c. to 21 c.
High brass wire	19¼c. to 21¾c.
Brass rod	17 c. to 20¾c.
Brass tube, brazed	32 c. to 35¾c.
Brass tube, seamless	21½c. to 23½c.
Copper tube, seamless	22½c. to 24½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 21½c. to 22c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20	
		Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$7.80 $7.55
		90 lb....	7.90 7.65
		100 lb....	8.00 7.75
IC..	$12.00 $10.75	IC....	8.15 7.90
IX..	13.75 12.25	IX....	9.15 8.90
IXX..	15.25 13.75	IXX....	10.15 9.90
IXXX..	16.50 15.08	IXXX....	11.15 10.90
IXXXX..	18.00 16.25	IXXXX....	12.15 11.90

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$8.35
IC	8.50
IX	9.50
Fire door stock	11.50

Tin

Straits pig	32½c.
Bar	38c. to 40c.

Copper

Lake ingot	15c.
Electrolytic	15c.
Casting	15c.

Spelter and Sheet Zinc

Western spelter	6½c. to 7c.
Sheet zinc, No. 9 base, casks	12c. to 13c.

Lead and Solder*

American pig lead	5½c.
Bar lead	6 c. to 7 c.
Solder, ½ and ½ guaranteed	23c.
No. 1 solder	21½c.
Refined solder	17½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	80c.
Commercial grade, per lb	40c.
Grade D, per lb	35c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	32c. to 35c.

Old Metals

The market is generally lower and very little business is being put through. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	9.75
Copper, heavy and wire	9.00
Copper, light and bottoms	7.75
Brass, heavy	5.75
Brass, light	4.25
Heavy machine composition	9.25
No. 1 yellow brass turnings	4.75
No. 1 red brass or composition turnings	7.25
Lead, heavy	3.25
Lead, tea	2.00
Zinc	2.75